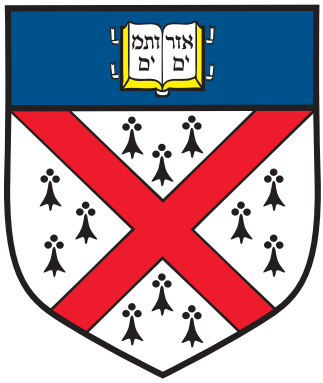
Yale College Programs of Study

Fall and Spring Terms

2025–2026



BULLETIN OF YALE UNIVERSITY

Series 121 Number 1 May 5, 2025

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The university reserves the right to amend or supplement the information published in this bulletin at any time, including but not limited to withdrawing or modifying the courses of instruction or changing the instructors.

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Contents

BUILDING ABBREVIATIONS

AKW	Arthur K. Watson Hall
BASS	Bass Center for Molecular and Structural Biology
BASSLB	Bass Library
BATTEL	Battell Chapel
BCMM	Boyer Center for Molecular Medicine
BCT	Becton Engineering and Applied Science Center
BF	Benjamin Franklin College
BK	Berkeley College
BM	Charles W. Bingham Hall
BML	Brady Memorial Laboratory
BR	Branford College
BRBL	Beinecke Rare Book and Manuscript Library
BRW35	35 Broadway
C	Connecticut Hall
CCAM	Center for Collaborative Arts and Media
CO451	451 College Street
CO493	493 College Street
CRB	Class of 1954 Chemistry Research Building
CSC	Child Study Center
D	Durfee Hall
DAVIES	Davies Auditorium, Becton Center
DC	Davenport College
DL	Dunham Laboratory
DOW	Dow Hall
EM	Edwin McClellan Hall
ES	Ezra Stiles College
ESC	Class of 1954 Environmental Science Center
EVANS	Edward P. Evans Hall
F	Farnam Hall
GH	Grace Hopper College
GML	Greeley Memorial Laboratory
GRN	Holcombe T. Green, Jr., Hall
HEN	Hendrie Hall
HLH17	17 Hillhouse Avenue
HLH28	28 Hillhouse Avenue
HQ	Humanities Quadrangle
JE	Jonathan Edwards College
K	Kirtland Hall
KGL	Kline Geology Laboratory
KRN	Kroon Hall
KT	Kline Tower
L	Lawrance Hall
LC	Linsly-Chittenden Hall
LEPH	Laboratory of Epidemiology and Public Health
LFOP	Leitner Family Observatory and Planetarium
LGH	Abby and Mitch Leigh Hall
LOM	Leet Oliver Memorial Hall
LORIA	Jeffrey H. Loria Center
LUCE	Henry R. Luce Hall
LWR	Lanman-Wright Memorial Hall
MC	Morse College
MEC	Malone Engineering Center
ML	Mason Laboratory
MY	Pauli Murray College
OML	Osborn Memorial Laboratories
PC	Pierson College
PH	Phelps Hall
PR77	77 Prospect Street
PWG	Payne Whitney Gymnasium
RDH	Rudolph Hall
RKZ	Rosenkranz Hall
RSN	Rosenfeld Hall
S	Sage Hall
SA10	10 Sachem Street
SCL	Sterling Chemistry Laboratory
SDQ	Sterling Divinity Quadrangle
SHM	Sterling Hall of Medicine
SLB	Sterling Law Building
SM	Silliman College
SMH	Sprague Memorial Hall
SML	Sterling Memorial Library
SPL	Sloane Physics Laboratory
SSS	Sheffield-Sterling-Strathcona Hall
STOECK	Stoeckel Hall
SY	Saybrook College
TAC	The Anlyan Center
TC	Trumbull College
TD	Timothy Dwight College
TM432	432 Temple Street
UT	University Theatre
V	Vanderbilt Hall
W	Welch Hall
WALL53	53 Wall Street

WALL81	81 Wall Street
WALL82	82-90 Wall Street
WGS	Whitney Grove Square
WH55	55 Whitney Avenue
WL	Wright Laboratory
WL-W	Wright Laboratory West
WLH	William L. Harkness Hall
WTS	Watson Center
YCBA	Yale Center for British Art
YK212	212 York Street
YK220	220 York Street
YSB	Yale Science Building
YUAG	Yale University Art Gallery

FINAL EXAMINATION SCHEDULES

Rules governing the conduct of final examinations are given in Academic Regulations, section G, Reading Period and Final Examination Period.

An examination group number is assigned to every course. Examination group assignments are based on course meeting times, according to the following scheme. Hours shown are the times at which courses begin:

(31)	M, W, or F, 8:20 a.m.		
(32)	M, W, or F, 9 or 9:25 a.m.	(22)	T or Th, 9 or 9:25 a.m.
(33)	M, W, or F, 10:30 a.m.	(23)	T or Th, 10:30 a.m.
(34)	M, W, or F, 11:35 a.m.	(24)	T or Th, 11:35 a.m.
(36)	M, W, or F, 1 or 1:30 p.m.	(26)	T or Th, 1 or 1:30 p.m.
(37)	M, W, or F, after 2 p.m.	(27)	T or Th, after 2 p.m.

Note: With the exception of courses assigned to common examination groups, a change in class meeting time will alter the examination time.

Courses with multiple sections but a common examination are assigned to an examination group from (61) to (69). Typical assignments include (but are not limited to): (61) foreign languages; (63) introductory-level English; (64) introductory economics; (65) physics; (69) introductory mathematics.

The examination group (50) is assigned to courses whose times are published HTBA, or whose times belong to more than one of the groups listed above.

Courses in group (0) usually have no regular final examination, concluding instead with a term essay or other final exercise. Instructors of such courses may schedule a regular final examination based on the course starting time. The time slots of 2 p.m. during the last day of the reading period and 7 p.m. on the last day of the final exam period are available for makeup final exams only.

* Makeup final exams only

Fall	**9 a.m.**	**2 p.m.**	**7 p.m.**
Dec. 10 W	(61)	(34)	(69)
Dec. 11 Th	(64)	(24)	(23)
Dec. 12 F	(36)	(65)	
Dec. 15 M	(37)	(26)	(22)
Dec. 16 T	(33)	(32)	(63)
Dec. 17 W	(31)	(27)	*

Spring	**9 a.m.**	**2 p.m.**	**7 p.m.**
Apr. 29 W	(64)	(22)	(61)
Apr. 30 Th	(32)	(24)	(31)
May 1 F	(26)	(69)	
May 4 M	(65)	(36)	(63)
May 5 T	(37)	(34)	(27)
May 6 W	(23)	(33)	*

IDENTIFICATION CARDS, YALE UNIVERSITY

Yale University issues identification (ID) cards to faculty, staff, and students. ID cards support the community's safety and security by allowing access to many parts of campus: dining halls and cafés, residential housing, libraries and athletic centers, workspaces, labs, and academic buildings. Cultivating an environment of public safety requires the entire community to work together to ensure appropriate use of our spaces, as well as to foster a sense of belonging for all members of our community.

University policies, regulations, and practice require all students, faculty, and staff to carry their Yale ID card on campus and to show it to university officials on request. Yale ID cards are not transferable. Community members are responsible for their own ID card and should report lost or stolen cards immediately to the Yale ID Center (https://idcenter.yale.edu).

Members of the university community may be asked to show identification at various points during their time at Yale. This may include but not be limited to situations where: individuals are entering areas with access restrictions; for identification in emergency situations; to record attendance at a particular building or event; or other academic or work-related reasons related to the safe and effective operation and functioning of Yale's on-campus spaces.

For some members of our community, based on the needs and culture of their program, department and/or characteristics of their physical spaces, being asked to show an ID card is a regular, even daily, occurrence. However, for others it may be new or infrequent. For some, being asked to produce identification can be experienced negatively, as a contradiction to a sense of belonging or as an affront to dignity. Yale University is committed to enhancing diversity, supporting equity, and promoting an environment that is welcoming, inclusive, and respectful. University officials requesting that a community member show their ID card should remain mindful that the request may raise questions and should be prepared to articulate the reasons for any specific request during the encounter. In addition, individuals requesting identification should also be prepared to present their own identification, if requested.

KEY TO COURSE LISTINGS

AFAM	Course subjects are listed by three- or four-letter abbreviations in capitals. See the complete list of Subject Abbreviations.
Staff	Staff is listed when an instructor has yet to be assigned to a course or when there are multiple instructors. Refer to Yale Course Search (https://courses.yale.edu) for individual section instructors.
Prerequisite: MATH 1200	Prerequisites and recommendations are listed below the course description.
L5, HU	Language courses are designated L1 (first term of language study), L2 (second term), L3 (third term), L4 (fourth term), or L5 (beyond the fourth term). Other distributional designations are QR, WR, HU, SC, and SO, representing quantitative reasoning, writing, humanities and arts, science, and social science, respectively. See "Distributional Requirements" under "Requirements for the B.A. or B.S. Degree" (http://next.catalog.yale.edu/ycps/academic-regulations/requirements-for-ba-bs-degree/) in the Academic Regulations.
0.5 Course cr	Most courses earn one course credit per term; variations are noted.
RP	A course designated "RP" meets during the reading period. See "Reading Period and Final Examination Period" (http://next.catalog.yale.edu/ycps/academic-regulations/reading-period-final-examination-period/) in the Academic Regulations.
PLSC 2417/SOCY 1704	A course with two or more subject codes in the title line, counts toward the major in each department.
TR	The abbreviation "TR" denotes a literature course with readings in translation.
Attributes	Courses with department-specific attributes, such as YC English: 18th/19th Century and YC BENG: Bioimaging, are applied toward the major requirements. See the program descriptions of relevant majors and certificates.
MCDB 2910L	A capital L following the course number denotes a science laboratory.

SUBJECT ABBREVIATIONS

ACCT	Accounting
AFAM	African American Studies
AFST	African Studies
AKKD	Akkadian
AMST	American Studies
AMTH	Applied Mathematics
ANTH	Anthropology
APHY	Applied Physics
ARBC	Arabic
ARCG	Archaeological Studies
ARCH	Architecture
ARMN	Armenian
ART	Art
ASL	American Sign Language
ASTR	Astronomy & Astrophysics
BENG	Biomedical Engineering
BIOL	Biology
BRST	British Studies
BURM	Burmese
CENG	Chemical Engineering
CGSC	Cognitive Science
CHEM	Chemistry
CHER	Cherokee
CHLD	Child Study Center
CHNS	Chinese
CLCV	Classical Civilization
CLSS	Classics
CPAR	Computing and the Arts
CPLT	Comparative Literature (previously LITR)
CPSC	Computer Science
CSEC	Computer Science and Economics
CSLI	Computing and Linguistics
CZEC	Czech
DEVN	DeVane Lecture Course
DRST	Directed Studies
DUTC	Dutch
EALL	East Asian Languages and Literatures
EAST	East Asian Studies
ECE	Electrical Engineering (previously EENG)
ECON	Economics
EDST	Education Studies
EEB	Ecology and Evolutionary Biology (previously E&EB)
EGYP	Egyptian
ENAS	Engineering and Applied Science
ENGL	English Language and Literature
ENRG	Energy Studies
ENVE	Environmental Engineering
EP&E	Ethics, Politics, and Economics
EPS	Earth and Planetary Sciences
ER&M	Ethnicity, Race, and Migration
EVST	Environmental Studies
FILM	Film and Media Studies
FLPN	Filipino
FNSH	Finnish
FREN	French
GLBL	Global Affairs
GMAN	German Studies
GREK	Ancient Greek
HEBR	Hebrew
HELN	Modern Greek (previously MGRK)
HGRN	Hungarian
HIST	History
HLTH	Global Health Studies
HMRT	Human Rights
HNDI	Hindi
HSAR	History of Art
HSHM	History of Science, Medicine, and Public Health
HUMS	Humanities
INDN	Indonesian
ITAL	Italian Studies
JAPN	Japanese
JDST	Jewish Studies
KHMR	Khmer
KREN	Korean
LAST	Latin American Studies
LATN	Latin
LING	Linguistics
MATH	Mathematics
MB&B	Molecular Biophysics and Biochemistry
MCDB	Molecular, Cellular, and Developmental Biology
MENG	Mechanical Engineering
MMES	Modern Middle East Studies
MTBT	Modern Tibetan
MUSI	Music
NAVY	Naval Science
NELC	Near Eastern Languages and Civilizations

NSCI	Neuroscience
OTTM	Ottoman
PERS	Persian
PHIL	Philosophy
PHYS	Physics
PLSC	Political Science
PLSH	Polish
PNJB	Punjabi
PORT	Portuguese
PSYC	Psychology
RLST	Religious Studies
ROMN	Romanian
RSEE	Russian, East European, and Eurasian Studies
RUSS	Russian
S&DS	Statistics and Data Science
SAST	South Asian Studies
SBCR	Bosnian-Croatian-Serbian
SCIE	Science
SKRT	Sanskrit
SLAV	Slavic Languages and Literatures
SNHL	Sinhala
SOCY	Sociology
SPAN	Spanish
SPEC	Special Divisional Major
SWAH	Kiswahili
TAML	Tamil
TBTN	Classical Tibetan
TDPS	Theater and Performance Studies (previously THST)
TKSH	Turkish
TWI	Twi
UKRN	Ukrainian
URBN	Urban Studies
USAF	Aerospace Studies
VIET	Vietnamese
WGSS	Women's, Gender, and Sexuality Studies
WLOF	Wolof
YDSH	Yiddish
YORU	Yorùbá
ZULU	isiZulu

TABLE OF ACCELERATION CREDIT

The table below shows how you gain and lose acceleration credit. Two is the maximum number of acceleration credits that can be earned in any subject.

In the left column are the criteria for granting acceleration credit based on AP scores. Students may receive acceleration credits by earning scores comparable to AP test scores on such tests as the International Baccalaureate (IB) higher-level examinations or the General Certificate of Education (GCE) A-level examinations. In subjects for which an AP score of 4 or 5 earns acceleration credit, a score of 6 or 7 on II B higher-level exams, or B or A on A-levels, is required; in subjects that require an AP score of 5 for acceleration credit, a score of 7 on the IB higher-level or an A on the A-level is required.

In the middle column are the courses whose successful completion—*in the first year with a grade of B, B+, A–, or A*—yields acceleration credit. In the right column are the courses resulting in the forfeit of acceleration credit.

In general, acceleration credit in a subject is forfeited by completing any course (other than a laboratory) with a lower number than the lowest-numbered course earning acceleration credit in the subject. Courses in this table were offered in 2024–2025 or are expected to be offered in 2025–2026. Except where noted, one acceleration credit is forfeited for each course credit earned in courses listed in the third column.

The University reserves the right to modify this table to reflect current course offerings. Regardless of the availability of AP tests, only the departments listed below award acceleration credit. The information in this table pertains to the Class of 2029.

	Acceleration Credit Awarded for AP Scores	**Acceleration Credit Awarded for First-Year Courses**	**Courses Resulting in the Forfeit of Acceleration Credit**
Chemistry	None	2 credits for CHEM 1700, CHEM 1740, CHEM 1750, CHEM 2200, CHEM 2210, CHEM 2300, CHEM 2520, CHEM 3320, or CHEM 3330.	If 2 acceleration credits awarded: 2 lost by CHEM 1610, CHEM 1630, or CHEM 1650, or any course numbered CHEM 1090 or lower.
Computer Science	None	1 credit for CPSC 2010 or CPSC 2230; 2 credits for CPSC 3230.	If 1 acceleration credit awarded: 1 lost by CPSC 1001. If 2 awarded: 2 lost by CPSC 1001, 1 lost by CPSC 2010 or CPSC 2230.

Economics	None	1 credit in microeconomics for ECON 2121 or ECON 2125; 1 credit in macroeconomics for ECON 2122 or ECON 2126.	Microeconomics credit lost by ECON 1108, ECON 1110, or ECON 1115; macroeconomics credit lost by ECON 1111 or ECON 1116.
English	1 credit for 5 on either AP English Lang and Comp or AP English Lit and Comp tests.	1 credit for ENGL 1020 or ENGL 1021; 1 credit for 1 term, 2 credits for 2 terms of ENGL 1025, ENGL 1026, ENGL 1027, ENGL 1028, ENGL 1029, ENGL 1030, or DRST 0001, DRST 0002.	ENGL 1014, ENGL 1015
History of Art	1 credit for 5 on AP test in Art History.	None	None
Languages	Chinese, French, German, Japanese, Latin, and Spanish only: 2 credits for 5 on AP test. For Italian: 1 credit for 5 on AP test. No additional credit for multiple tests in a single language. All other languages: None.	All languages listed in first column, except Italian: 2 credits for a scheduled L5 course. For Italian: 1 credit for a scheduled L5 course.	All languages listed in first column except Italian: 2 acceleration credits lost for L1, L2, L3, L1-L2 or L3-L4 course; 1 lost for L4 course. For Ital: 1 acceleration credit lost in both instances.

Mathematics	1 credit for 5 on AP Calculus AB test; 1 credit for 4 on Calculus BC test; 2 credits for 5 on Calculus BC test.	1 credit for MATH 1150, MATH 1160, or MATH 1180; 2 credits for 1200 or higher-numbered courses.	If 2 acceleration credits awarded: 2 lost by any course numbered MATH 1120 or lower; 1 lost by MATH 1150, MATH 1160, or MATH 1180. If 1 awarded: 1 lost by any course numbered 1120 or lower.
Music	1 credit for 5 on AP Music Theory test.	None	None
Physics	1 credit for 5 on either AP Physics C test, with 5 on AP Calculus AB test or 4 or 5 on Calculus BC test. 2 credits for 5 on both parts of Physics C test with requisite score on Calculus AB or BC test. No credit for AP Physics 1 or 2 tests.	2 credits for PHYS 2600, PHYS 2610 or for course numbered PHYS 4000 or higher.	If 1 acceleration credit awarded, 1 lost, and if 2 acceleration credits awarded, 2 lost, by any course numbered PHYS 2010 or lower.

VETERANS AFFAIRS: BILL PAYMENT AND PENDING MILITARY BENEFITS

Yale will not impose any penalty, including the assessment of late fees, the denial of access to classes, libraries, or other facilities, or the requirement that a student borrow additional funds, on any student because of the student's inability to meet their financial obligations to the institution, when the delay is due to the delayed disbursement of funding from VA under chapter 31 or 33.

Yale will permit a student to attend or participate in their course of education during the period beginning on the date on which the student provides to Yale a certificate of eligibility for entitlement to educational assistance under chapter 31 or 33 and ending on the earlier of the following dates: (1) the date on which payment from VA is made to Yale; (2) ninety days after the date Yale certifies tuition and fees following the receipt of the certificate of eligibility.

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ADMINISTRATIVE OFFICERS

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Karensa DiFonzo, B.A., Director of Undergraduate Financial Aid

YALE COLLEGE CALENDAR WITH PERTINENT DEADLINES

This calendar includes a partial summary of deadlines given in the Academic Regulations and in the Yale College online publication Undergraduate Regulations. Unless otherwise specified, references are to sections in the Academic Regulations, and deadlines fall at 5 p.m. (EST). The instructional week begins on Monday and ends on Sunday.

Dates are subject to change. Final exam dates updated 5/7/2025.

FALL 2025

Aug. 17	Su	Residences open to new students, 9:00 a.m.
TBD	TBD	Add/drop period opens, 8:00 a.m.
Aug. 20	W	Registration opens for first-year students and incoming Eli Whitney and transfer students, time TBD
Aug. 22	F	Residences open to upper-level students, 9:00 a.m.
Aug. 26	T	Required check-in meetings for upper-level students (Class of 2028, 9:00 a.m.; Class of 2027, 9:45 a.m.; Class of 2026, 10:30 a.m.)
Aug. 27	W	Fall classes begin.
Aug. 29	F	Friday classes do not meet; Monday classes meet instead.
Sept. 1	M	Labor Day; classes do not meet.
TBD	TBD	Add/drop period ends, 5:00 p.m.
Sept. 10	W	Withdrawal from Yale College on or before this date entitles a student to a full rebate of fall-term tuition (Undergraduate Regulations).
Sept. 10	W	Final deadline to apply for fall-term Leave of Absence.
Sept. 15	M	All students planning to complete degree requirements at the end of the fall term must file a petition by this date.
Sept. 15	M	Students in their final term of enrollment must petition to complete the requirements of two majors by this date.
Sept. 15	M	Students in their final term of enrollment planning to change their major, must by this date, declare as such in Yale Hub.
Sept. 15	M	Students in their final term of enrollment planning to earn a certificate, must by this date, declare as such in Yale Hub.
Sept. 18	Th	Last day to withdraw from a course offered in the first half of the fall term without the course appearing on the transcript.
Sept. 20	S	Withdrawal from Yale College on or before this date entitles a student to a rebate of one-half of fall-term tuition. See Undergraduate Regulations.
Oct. 1	W	Applications for spring 2026 Term Abroad close.
Oct. 10	F	Last day of courses offered in the first half of the fall term.
Oct. 10	F	Last day to withdraw from a course offered in the first half of the fall term.
Oct. 10	F	Last day to convert from a letter grade to the Cr/D/F option in a course offered in the first half of the fall term.
Oct. 13	M	Courses offered in the second half of the fall term begin.

Oct. 14	T	October recess begins after last academic obligation.
Oct. 20	M	Classes resume.
Oct. 24	F	Midterm.
Oct. 24	F	Last day to withdraw from a fall full-term course without the course appearing on the transcript.
Oct. 24	F	Deadline to apply for double credit in a single-credit course.
Oct. 24	F	Withdrawal from Yale College on or before this date entitles a student to a rebate of one-quarter of the term's tuition.
Oct. 24	F	Final ABX exam grades are due.
Nov. 6	Th	Last day to withdraw from a course offered in the second half of the fall term without the course appearing on the transcript.
Nov. 14	F	Spring term registration opens for GSAS students, 8:00 a.m.
Nov. 17	M	Spring term registration opens for Class of 2026, 8:00 a.m.
Nov. 18	T	Spring term registration opens for Class of 2027, visiting students, and Eli Whitney students (without a class year), 8:00 a.m.
Nov. 19	W	Spring term registration opens for Class of 2028, 8:00 a.m.
Nov. 20	Th	Spring term registration opens for Class of 2029, 8:00 a.m.
Nov. 21	F	November recess begins after last academic obligation.
Nov. 30	Su	Last day to relinquish on-campus housing for the spring term without charge (Undergraduate Regulations).
Dec. 1	M	Classes resume.
Dec. 5	F	Classes end; reading period begins.
Dec. 5	F	Last day to convert from a letter grade to the Cr/D/F option for a full-term course and/or a course offered in the second half of the fall term.
Dec. 5	F	Last day to withdraw from a full-term course and/or a course offered in the second half of the fall term.
Dec. 9	T	Reading period ends, 5:00 p.m.
Dec. 9	T	Deadline for all course assignments, other than term papers and term projects. This deadline can be extended only by a Temporary Incomplete (TI) authorized by the student's residential college dean.
Dec. 10	W	Final examinations begin, 9:00 a.m.
Dec. 17	W	Final examinations end; 5:30 p.m.; winter recess begins
Dec. 17	W	Deadline for all term papers and term projects. This deadline can be extended only by a Temporary Incomplete (TI) authorized by the student's residential college dean.
Dec. 18	Th	Residences close, 12 noon.
Dec. 18	Th	Spring term registration closes for all GSAS & YC students, 5:00 p.m.
Dec. 22	M	Official degree conferral date for fall 2025. Degree clearance begins once final grades have been submitted.

SPRING 2026

Jan. 5	M	Fall-term final grades due.
TBD	TBD	Add/drop period opens for all GSAS & YC students, 8:00 a.m.
Jan. 7	W	Residences open, 9:00 a.m.
Jan. 12	M	Spring-term classes begin.
Jan. 15	Th	Students in their final term of enrollment must petition for permission to complete the requirements of two majors by this date.

Jan. 15	Th	Students in their final term of enrollment planning to change their major, must by this date, declare as such in Yale Hub.
Jan. 15	Th	Students in their final term of enrollment planning to earn a certificate, must by this date, declare as such in Yale Hub.
Jan. 19	M	Martin Luther King Jr. Day; classes do not meet.
Jan. 20	T	Applications close for Yale 2026 Summer Session Abroad.
TBD	TBD	Add/drop period closes for all GSAS & YC students, 5:00 p.m.
Jan. 23	F	Friday classes do not meet; Monday classes meet instead.
Jan. 26	M	Final deadline to apply for a spring-term Leave of Absence.
Jan. 26	M	Withdrawal from Yale College on or before this date entitles the student to a full rebate of spring-term tuition (Undergraduate Regulations).
Feb. 3	T	Last day to withdraw from a course offered in the first half of the spring term without the course appearing on the transcript.
Feb. 5	Th	Withdrawal from Yale College on or before this date entitles a student to a rebate of one-half of spring-term tuition (Undergraduate Regulations).
Feb. 25	W	Last day of courses offered in the first half of the spring term.
Feb. 25	W	Last day to withdraw from a course offered in the first half of the spring term.
Feb. 25	W	Last day to convert from a letter grade to Cr/D/F option for a course offered in the first half of the spring term.
Feb. 26	Th	Courses offered in the second half of the spring term begin.
Mar. 3	T	Applications close for 2026 Non-Yale Summer Abroad.
Mar. 6	F	Midterm.
Mar. 6	F	Spring recess begins after last academic obligation.
Mar. 6	F	Last day to withdraw from a spring full-term course without the course appearing on the transcript.
Mar. 6	F	Deadline to apply for double credit in a single-credit course.
Mar. 6	F	Withdrawal from Yale College on or before this date entitles a student to a rebate of one-quarter of the term's tuition (Undergraduate Regulations).
Mar. 6	F	Final ABX exam grades are due.
Mar. 23	M	Classes resume.
Apr. 1	W	Applications close for fall 2026 Term Abroad or 2026–2027 Year Abroad close.
Apr. 2	Th	Last day to withdraw from a spring second-half course without the course appearing on the transcript.
Apr. 10	F	Fall term registration opens for Graduate School students, 8:00 a.m.
Apr. 13	M	Fall term registration opens for Class of 2027, 8:00 a.m.
Apr. 14	T	Fall term registration opens for Class of 2028, visiting students, and Eli Whitney students (without a class year) 8:00 a.m.
Apr. 15	W	Fall term registration opens for Class of 2029, 8:00 a.m.
Apr. 24	F	Classes end; reading period begins.
Apr. 24	F	Last day to convert from a letter grade to Cr/D/F option for a full-term course and/or a course offered in the second half of the spring term.
Apr. 24	F	Last day to withdraw from a full-term course and/or a course offered in the second half of the spring term.
Apr. 28	T	Reading period ends, 5:00 p.m.

Apr. 28	T	Deadline for all course assignments, other than term papers and term projects. This deadline can be extended only by a Temporary Incomplete (TI) authorized by the student's residential college dean.
Apr. 29	W	Final examinations begin, 9:00 a.m.
May 1	F	Applications for fall-term Leaves of Absence due.
May 6	W	Final examinations end, 5:30 p.m.
May 6	W	Deadline for all term papers and term projects. This deadline can be extended only by a Temporary Incomplete (TI) authorized by the student's residential college dean.
May 7	Th	Residences close for non-seniors, 3 p.m.
May 8	F	Final grades due for graduating seniors.
May 13	W	Final grades due for continuing students.
May 15	F	Registration closes for Yale College and Graduate School students.
May 18	M	University Commencement.
May 19	T	Residences close for seniors, 12 noon.

SUMMER SESSION 2026

Courses offered during the summer are offered through Yale Summer Session. Further information is available from the Yale Summer Session office or on the website.

MISSION STATEMENT OF YALE COLLEGE

The mission of Yale College is to seek exceptionally promising students of all backgrounds from across the nation and around the world and to educate them, through mental discipline and social experience, to develop their intellectual, moral, civic, and creative capacities to the fullest. The aim of this education is the cultivation of citizens with a rich awareness of our heritage to lead and serve in every sphere of human activity.

In 2023, Yale College adopted a new strategic plan, with the following vision, in service to the mission:

Yale College offers a liberal education that aims to:

- Educate talented students of diverse backgrounds to lead and serve in a complex and changing society.
- Provide a supportive residential community of learning in which social experience and the free exchange of ideas underpin the pursuit of knowledge.
- Cultivate both the broad intellectual, moral, civic, and creative capacities and the more specialized skills that will allow students to thrive beyond the college gates.
- Draw on the distinctive strengths and traditions of Yale University as a globally recognized leader across the arts, humanities, social sciences, sciences, engineering, and the professions.

We seek to educate students who are broad-minded and autonomous, capable of making judgments and taking responsibility for their decisions. We believe that a liberal education should encourage students to become curious, engaged citizens. It should also prepare them well for their professional lives and further educational opportunities and help them develop as active learners who thrive in complex environments.

A MESSAGE FROM THE DEAN OF YALE COLLEGE

Yale College Programs of Study is companion to the roughly 2,000 courses to be offered in Yale College in 2025–2026. It is a resource to use as you learn about the curriculum, intended to complement the counsel of faculty and deans who can guide you. Here you will find the guiding principles of Yale College's liberal arts education, including its distributional and major requirements. Use it to explore old and new interests in ways that will lead you to become cultivated citizens of the world. Our expectation is that when you leave Yale, you will not only have acquired a trained mind, broadened knowledge, and a greater sense of citizenship; you also will have come to a deeper understanding of the continuing joy of disciplined learning.

We hope that *Yale College Programs of Study* will stir you to consider courses of study that you had never before imagined and lead you deeper into intellectual worlds you already have explored. It represents the heart and soul of what the Yale faculty holds in promise for you. It comes to you with our best wishes for a successful year.

Pericles Lewis
Douglas Tracy Smith Professor of Comparative Literature
Dean of Yale College

I. YALE COLLEGE

The Undergraduate Curriculum

Yale College, the undergraduate branch of Yale University, offers instruction in more than 120 subjects spanning the liberal arts, sciences, and engineering. Its signature residential college system and expansive extracurricular programs sustain a supportive community of students, staff, scholars, and researchers. For more than three centuries, Yale has provided leadership in undergraduate education in the liberal arts and sciences. While the University eventually grew to incorporate graduate and professional education, all undergraduate education at Yale continues to be provided through the College. Now in its fourth century, the College remains a recognized leader worldwide.

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Yale seeks to educate students who are broad-minded and autonomous, capable of making judgments and taking responsibility for their decisions. A Yale College education should encourage students to become curious, engaged citizens. It should also prepare them well for their professional lives and further educational opportunities and help them develop as active learners who thrive in complex environments.

This philosophy of education corresponds with that expressed in the Yale Report of 1828, which draws a distinction between "expanding [the mind's] powers, and storing it with knowledge." Acquiring facts is important, but learning how to think critically and creatively in a variety of ways takes precedence.

The College encourages students to learn broadly and deeply. Each student completes a major in one of the College's 80 programs or departments. The distributional requirements described in this bulletin ensure that students learn about a variety of subjects and intellectual approaches. In addition, the College requires that all students take courses that develop certain foundational skills— writing, quantitative reasoning, and language competency—that hold the key to opportunities in later study and later life. In each skill, students are required to travel some further distance from where they were in high school so that each competency matures and deepens. A student working toward a bachelor's degree normally takes four or five courses each term and receives the B.A. or B.S. degree after completing thirty-six term courses or their equivalent in eight terms of enrollment. A candidate for the bachelor's degree is required, in

completing the thirty-six term courses, to fulfill the distributional requirements, as well as the requirements of a major program.

In a time of increasing globalization, both academic study of the international world and firsthand experience of foreign cultures are crucial. Yale College urges all of its students to consider a summer, a term, or a year abroad sometime during their college careers.

Yale College forms part of a great university and encourages students to participate in the conversation of a scholarly community that defines the pursuit of knowledge in such a university. While the College's goal of educating talented young people for future leadership has not changed since its founding, Yale has continually expanded the range of subjects it teaches, the excellence of its curriculum, pedagogy, and research, and the diversity of its student body. It currently offers instruction to over 6,000 students. For almost a century, the residential colleges have created enduring communities that are an essential part of the broader Yale ecosystem. As a distinctive community of learning, Yale College also seeks to instill an ethos of service—a sense of belonging on campus and a call to contribute beyond it. Participation in the College and University communities requires respect and tolerance and a willingness to listen to one another. Most of all, it requires an openness on the part of each member of the Yale community—an openness to learn and a humility about how little each of us actually knows.

Distributional Requirements

The distributional requirements described below are intended to ensure that all graduates of Yale College have an acquaintance with a broad variety of fields of inquiry and approaches to knowledge. These requirements are the only specific rules limiting the selection of courses outside a student's major program. The distributional requirements are intended as starting points, and students should feel free to pursue even greater breadth with their electives.

DISTRIBUTIONAL REQUIREMENTS FOR THE BACHELOR'S DEGREE

Students must fulfill disciplinary area requirements by taking no fewer than two course credits in the humanities and arts, two in the sciences, and two in the social sciences. Students must also fulfill skills requirements by taking at least two course credits in quantitative reasoning, two course credits in writing, and courses to further their language proficiency. Depending on their level of accomplishment in foreign languages at matriculation, students may fulfill this last requirement with one, two, or three courses or by certain combinations of course work and approved study abroad.

Area requirement in the humanities and arts (two course credits) Study of the humanities and arts—those subjects that explore how we chronicle and interpret the expression of human experience—cultivates an appreciation of the past and enriches our capacity to participate in the life of our times. By engaging other cultures and civilizations, both ancient and modern, students gain insight into the experiences of others while also obtaining an opportunity to critically examine their own. Through the study and practice of the arts, students analyze, create, and perform works allowing them to explore or experience firsthand the joy and discipline of artistic expression. Rigorous and systematic study of the humanities and the arts

fosters tolerance for ambiguity and sophisticated analytic skills that provide essential preparation for careers in most areas of contemporary life. Independently of any specific application, study of these subjects teaches understanding and appreciation of the highest achievements of humanity.

Area requirement in the sciences (two course credits) Science is the study of the principles of the physical and the natural world through observation and experimentation. The theoretical exploration, experimental analysis, and firsthand problem solving inextricably linked to scientific inquiry give rise to new discoveries and modes of thought. Acquiring a broad view of what science is, what it has achieved, and what it might continue to achieve is an essential component of a college education. Close study of a science develops critical faculties that educated citizens need to evaluate natural phenomena and the opinions of experts, and to make, understand, and evaluate arguments about them. Scientific literacy teaches students to appreciate the beauty and complexity of the natural and physical worlds often hidden from casual observation.

Area requirement in the social sciences (two course credits) Broadly conceived, the social sciences study human social behavior and networks using a variety of methodologies and both qualitative and quantitative analysis. The disciplines in the social sciences teach us about who we are as social beings and help us appreciate the perspective of the other as well as the particularities of society. Methods in the social sciences test for connections between the familiar and the foreign, the traditional and the contemporary, the individual and the group, the predicted result and the anomalous outcome. Their theories propose explanations for the entire range of human phenomena. Study of the social sciences prepares students for lives of civic engagement and develops a nuanced sense of the world around them.

Skills requirement in language (at least one course, depending on preparation) The study of languages has long been one of the distinctive and defining features of a liberal arts education and, in the world of the twenty-first century, knowledge of more than one language is increasingly important. The benefits of language study include enhanced understanding of how languages work, often resulting in heightened sophistication in the use of one's own language; unmediated access to texts otherwise available only in translation, or not at all; and the ability to recognize and cross cultural barriers.

All Yale College students are required to engage in study of a language, regardless of the level of proficiency at the time of matriculation. Depending on their preparation, students take one, two, or three terms of language study to fulfill the distributional requirement. Students may complete an approved study abroad program in lieu of intermediate or advanced language study at Yale. Details of the language distributional requirement are listed under Distributional Requirements in the Academic Regulations, section A, Requirements for the B.A. or the B.S. Degree.

Skills requirement in quantitative reasoning (two course credits) The application of quantitative methods is critical to many different disciplines. Mathematics and statistics are basic tools for the natural and the social sciences, and are useful in many of the humanities as well. Information technology and the rigorous dissection of logical arguments in any discipline depend on algorithms and formal logical constructs. An

educated person must be able to use quantitative information to make, understand, and evaluate arguments.

Many quantitative reasoning courses are taught through the departments of Mathematics, Statistics and Data Science, Computer Science, Economics, and through undergraduate courses offered in the School of Engineering and Applied Science. Quantitative reasoning courses may also be found in a range of other programs.

Skills requirement in writing (two course credits) The ability to write well is one of the hallmarks of a liberally educated person and is indispensable to leadership in most fields of endeavor. As students strengthen their writing skills, they develop the ability to express more nuanced thought and intellectual practices that distinguish active from passive learners.

The English department in particular offers many courses that focus on writing clearly and cogently, and courses in other departments stress writing skills within the context of their disciplines. Hundreds of courses, spanning most academic programs, give special attention to writing. Such courses, designated WR, do not necessarily require more writing than other courses; rather, they provide more help with writing assignments. Some characteristics of WR courses include writing to discover ideas, learning from model essays, detailed feedback, and reviewing writing in small groups. Note that credit toward the writing requirement cannot be earned in courses in creative writing (specifically poetry, fiction, and playwriting), nor in courses conducted in a language other than English.

Major Programs

All candidates for a bachelor's degree in Yale College must elect a major program. The requirements for a major are described in general terms in the sections below, and in more detail under Subjects of Instruction. Students should acquaint themselves fully with all the requirements of the major they plan to enter, considering not only the choice of courses in the current term but also the plan of their entire work in the last two or three years in college. Advising in the major is provided by the director of undergraduate studies (DUS) or an adviser designated by the department or program, and students should plan a schedule of courses in their major in consultation with them. In addition, after a student has declared a major, the DUS or the DUS's designee is normally the person who reviews the student's course schedule.

Students seeking the B.S. or the B.A. degree with a major in science or engineering are expected to declare their majors at the beginning of sophomore year, although a student who has completed the prerequisites may elect a science major later. Sophomores interested in majoring in science or engineering should discuss their major course of studies with the director of undergraduate studies or an adviser designated by the department or program. Students seeking the B.A. degree with a major in a field other than science or engineering are expected to declare their major by the end of the sophomore year and should do so no later than the beginning of the junior year.

SELECTION OF A MAJOR

In designing a program of study, the student ought to plan for depth of concentration as well as breadth of scope. To study a subject in depth can be rewarding and energizing and can form the basis of the interests and occupations of a lifetime. Knowledge advances by specialization, and one can gain some of the excitement of discovery by pressing toward the outer limits of what is known in a particular field. Intense study of a seemingly narrow area of investigation may disclose ramifications and connections that alter perspectives on other subjects. Such study also sharpens judgment and acquaints a person with processes by which new truths can be found.

In order to gain exposure to this kind of experience, students must elect and complete a major—a subject in which they will work more intensively than in any other. Yale College offers more than eighty possible majors. The department or program concerned sets the requirements for each major, which are detailed under Subjects of Instruction.

Some students will have made a tentative choice of a major before entering college. Others will have settled on a general area—for example, the humanities, the social sciences, the natural sciences—without being certain of the specific department or program of their major. Still others will be completely undecided. Many students who arrive with their minds made up change them after a year or two. Even students who feel certain of their choices should keep open the possibility of a change. In selecting courses during their first two years, students should bear in mind not only the distributional requirements, but also the need for some exploration of the subjects to which they feel drawn.

THE MAJOR (B.A. OR B.S.)

A major program usually includes at least twelve term courses in the same area, progressing from introductory to advanced work, which become the focus of a student's program in the junior and senior years. Majors are offered by departments, interdepartmental programs, or interdisciplinary programs. In many departments and programs, a limited number of courses in related fields may be offered in fulfillment of the requirements for the major. Many majors have prerequisites, usually taken in the first year or sophomore year.

In all majors, the student must satisfy a senior requirement, usually a senior essay, senior project, or senior departmental examination. In an intensive major, the student must fulfill additional requirements, such as taking a prescribed seminar, tutorial, or graduate course, or completing some other project in the senior year.

SPECIAL DIVISIONAL MAJORS

A Special Divisional Major affords an alternative for the student whose academic interests cannot be met within one of the existing major programs. Such students may, with the approval of the Committee on Honors and Academic Standing, design special majors of their own in consultation with members of the faculty and in accordance with the procedures outlined under Subjects of Instruction. A Special Divisional Major may not be offered as one of two majors.

Certificate Programs

Central to the mission of Yale College is ensuring a broad education rooted in the liberal arts and sciences. That education should provide both breadth and depth across a wide array of disciplines and be responsive to the shifting landscape of those disciplines and their interrelationships. To encourage students to engage within and across departmental and disciplinary boundaries, Yale College offers both discipline-based and skills-based certificates. A certificate is not a typical "minor" or a smaller version of a major; instead, it offers opportunities for students to deepen a skill or to bring disparate elements into focus. There are three types of certificates offered at Yale College: Advanced Language Certificates, Skills-Based Certificates, and Interdisciplinary Certificates. See Certificates in Yale College. Only students enrolled in a bachelor's degree program are eligible to earn a certificate.

Students must declare their intent to earn a certificate by January 15 or September 15 in their final term of enrollment. This is done on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub. Once declared, Degree Audit will track students' progress toward completion of the certificate.

International Experience

Experience abroad is an invaluable complement to the on-campus experience. Such experience may include course work at foreign universities, intensive language study, directed research, independent projects, internships, laboratory work, and volunteer service. To augment students' education in a globalizing world, Yale College provides a variety of international opportunities during term time, summers, and post-graduation, as well as a large and growing number of fellowships to financially support students abroad. Students can visit the Yale Study Abroad, Office of Career Strategy, and Yale Fellowships and Funding websites to explore options for study abroad, search for international internships and careers, and seek funding for study, research, and work experiences off campus.

SUMMER ABROAD

Summer courses abroad are offered through Yale Summer Session Programs Abroad and Yale in London. Students may also apply to earn transfer credit from eligible outside summer study abroad programs by submitting a Non-Yale Summer Abroad application. Additional information is available from the Yale Study Abroad office. Students receiving financial aid are eligible for summer funding (one summer) through the International Study Award (ISA) program.

YEAR OR TERM ABROAD

In recognition of the special value of formal study abroad, Yale College allows juniors and second-term sophomores to earn a full year or term of credit toward the bachelor's degree through the Year or Term Abroad program. Participation in the program provides students the opportunity to approach academic study through a different cultural perspective. Students apply to Yale Study Abroad for approval of a program of study abroad. The pertinent application procedures and regulations are listed in the

Academic Regulations, section K, Special Academic Programs. Additional information is available from the Yale Study Abroad office.

YALE IN LONDON

The Yale in London program offers spring-term courses that explore the arts, politics, and culture in Britain through its diasporic and global histories. Based at the Paul Mellon Centre for Studies in British Art, located in central London, the program offers an opportunity to engage closely with London and the United Kingdom's museums, collections, and spaces. The program is open to all undergraduates, including seniors. Courses in the program are considered Yale course credits, so students who have already studied abroad and have exhausted their transfer credits can still participate in Yale in London. Further information is available on the program website, from the Yale in London office at the Yale Center for British Art, or by email to yaleinlondon@yale.edu.

YALE IN LONDON SUMMER PROGRAM

Yale in London offers two overlapping summer sessions at the Paul Mellon Centre for Studies in British Art in central London, each lasting six weeks. There are two courses in each session, which explore the arts, politics, and culture in Britain and its diasporic and global histories. The courses are open to all undergraduates, including seniors, and carry full Yale course credit, although enrollment in a Yale in London summer session does not count as a term of enrollment in Yale College. Course descriptions and further information are available on the program website, from the Yale in London office at the Yale Center for British Art, or by email to yaleinlondon@yale.edu.

THE MACMILLAN CENTER

The Whitney and Betty MacMillan Center for International and Area Studies at Yale is the University's focal point for promoting teaching and research on all aspects of international affairs, societies, and cultures around the world. It brings together scholars from relevant schools and departments to provide comparative and problem-oriented teaching and research on regional, international, and global issues. The MacMillan Center oversees six undergraduate majors: African Studies, East Asian Studies, Latin American Studies, Modern Middle East Studies, Russian and East European Studies, and South Asian Studies. Language training is integral to each of the majors. Further information about the MacMillan Center is available on the Yale MacMillan Center website.

Experiential Learning

Yale College recognizes that experiential learning is a valued and integral part of the Yale College academic experience, enabling students to make the transition from the classroom into their postgraduate professional careers. This experience can be acquired through a variety of means, including but not limited to summer internships, volunteer opportunities, independent projects, and research opportunities. Yale College has a number of resources available to help students identify the experiential opportunity that best complements and enhances their academic goals. The Office of Career Strategy and the Office of Fellowships are two helpful portals, available to all Yale College students. Students receiving financial aid may also be eligible for summer

funding through the Summer Experience Award and the International Study Award (ISA).

Yale Summer Session

Yale Summer Session offers courses in the arts, engineering, humanities, mathematics, biological and physical sciences, and the social sciences. While many Summer Session courses are offered on campus in New Haven, an increasing number are offered online, and several others are offered as part of programs abroad. Courses in Summer Session are equivalent in credit and satisfy the same distributional requirements as their academic year counterparts, but are offered in a more concentrated and intensive form. Yale College students receive credit in Yale College for work successfully completed in Yale Summer Session. There are no auditing privileges in Yale Summer Session. Further information is available from the Yale Summer Session office or on the Summer Session website.

Advising and Academic Resources

ADVISING

What students ultimately take away from their four years at Yale largely depends on the careful planning they apply to their programs of study. Entering students are not expected to map out a schedule of courses for the subsequent four years, but they should think ahead and make plans for the terms to come. There will be time and opportunity for students to revise such plans as their academic ideas develop.

Students have four years at Yale to explore a range of academic subjects and interests. They should consider those areas that interest them most, while also taking time to learn about other fields that will broaden their horizons.

During the first year, students should consider the following suggestions:

- Take an introductory course or two in areas of special interest that might lead to the pursuit of a certificate or a different major.
- Fulfill one or more distributional requirements by taking a course in another broad area of the university (humanities, social sciences, sciences).
- Develop skills in writing and/or quantitative reasoning.
- Consider additional study of a non-native language, or learning a new language.
- Consider taking a course in a field that is both intriguing and never before studied.

As students shape their educational goals, they should seek informed advice. For incoming students who have not yet developed relationships with academic advisers on campus, Yale College offers summer advising sessions and a constellation of advising linked to the residential colleges. As students progress in their studies, they may select as their adviser a member of the faculty in an intended or potential major to guide their course selection.

In addition to these advisers, students often seek advice about academic matters, internship and research opportunities, student life, study abroad, and post-graduation options from other offices on campus. Staff at the University Libraries, the Yale College Dean's Office, and the cultural centers are ready to support students in a variety of

endeavors, and the staff in the Study Abroad Office, Fellowship Programs Office, the Office of Career Strategy (including the Health Professions Advisory Program), and Yale Summer Session is available to provide focused advising.

Residential Colleges

There are fourteen residential colleges: Berkeley, Branford, Davenport, Timothy Dwight, Jonathan Edwards, Benjamin Franklin, Grace Hopper, Morse, Pauli Murray, Pierson, Saybrook, Silliman, Ezra Stiles, and Trumbull. Leading each one is a resident head of college, and in each college a resident dean advises students on both academic and nonacademic matters. Associated with the head and the dean as fellows of the college are other members of the University drawn from different departments and schools, many of whom serve as advisers to first-year students and sophomores in the college. In addition, a group of seniors in each residential college, known as first-year counselors, serves as peer advisers to first-year students. Additional information about advising resources in the residential colleges may be found on each college website and the Advising Resources website.

Academic Departments

In each academic department and for every undergraduate major, a director of undergraduate studies (DUS) oversees the curriculum, placement matters, and advising resources for the major. In small majors, the DUS also typically serves as the primary adviser for all students in the major; in large majors, other members of the faculty often assist the DUS in providing advice to students. Much information about course placement and prerequisites, as well as requirements for each major, may be found in Chapter III. Additional information about advising resources and faculty in a department or program may be found on the relevant department website.

ACADEMIC RESOURCES

Yale Poorvu Center for Teaching and Learning

The Yale Poorvu Center for Teaching and Learning (the Poorvu Center) provides an array of teaching, tutoring, writing, and technology-enabled learning programs distributed across the University. The center supports student learning and provides opportunities for students to develop as teachers, mentors, and leaders. Located in Sterling Memorial Library, the Poorvu Center includes community study space and a media studio. More information is available on the Poorvu Center website.

WRITING TUTORS AND WRITING PARTNERS

The Poorvu Center provides several ways for students to get help with writing. Each residential college has its own dedicated writing tutor. Tutors meet with students to discuss rough drafts of work in progress, research techniques, revision strategies, or other matters relevant to effective writing. Tutors offer free one-on-one help with any writing project: senior essays, course papers, applications, or anything intended for publication. The Writing Partners, another resource, are undergraduate and graduate students who offer a student's-eye view of writing and revision. Operating out of the Poorvu Center in Sterling Library, Writing Partners offer in-person, drop-in writing support daily. Students may also meet with Writing Partners online on select mornings and evenings. Finally, the Poorvu Center website offers writing handouts, model

papers, a list of student publications, a guide to writing with Turnitin, and information on using sources effectively.

STEM TUTORING & PROGRAMS

The Poorvu Center provides quantitative reasoning (QR) and science tutoring (Sc) for most relevant fields in Yale College. Several courses provide their own Course-Based Peer Tutors (CBPTs) and Undergraduate Learning Assistants (ULAs) who may help students as they work on problem sets or study for exams, who may review returned assignments, and who are there to provide more support for students with difficulties. Information about CBPTs and ULAs is available on individual course syllabi and the Canvas website. If a particular course does not have a CBPT/ULA, or if a student requires more help, the Residential College Math/Science Tutors offer drop-in hours that cover most science and QR topics. Finally, students who need more individual attention, in courses without CBPTs or ULAs, may apply for small-group tutoring. More information on all of these programs may be found on the Poorvu Center website.

Office of Educational Opportunity

The Office of Educational Opportunity (OEO), launched on July 1, 2023, helps students more easily access the programs and resources that can foster their success at Yale. This office oversees and plans programs for Academic Strategies, FGLI Thrive, STEM Navigators, and the Disability Peer Mentor Program. For questions about any of these programs, contact Karin Gosselink (karin.gosselink@yale.edu), Assistant Dean for Educational Opportunity in Yale College.

ACADEMIC STRATEGIES PROGRAM

The Academic Strategies Program provides information, workshops, and individual mentoring to all undergraduate students to help them thrive as students at Yale. Strategies discussed include time management, cultivating faculty mentorship, managing a heavy reading load, exam study strategies, and more. Peer academic mentors are also available to help individual students develop and adopt skills central to active, empowered learning. Students may request to be matched with a mentor by emailing academicstrategies@yale.edu. Faculty and staff also may directly refer students to Lynda Paul (lynda.paul@yale.edu), Associate Director.

FGLI THRIVE FOR FIRST-GENERATION/LOWER-INCOME STUDENTS

Students who identify as first-generation and/or lower-income (FGLI) can find guidance and community through our FGLI Peer Mentorship Groups and explore our FGL supports through the FGL Community Initiative, a partnership between the OEO and the Office of Student Engagement. FGLI Peer Mentorship Groups offer peer support for first-year and sophomore FGLI students. Biweekly sessions expose students to key academic, extracurricular, and pre-professional resources. FGLI Thrive also organizes information sessions and events for the wider FGLI community. Students sign up in early September; for more information, contact Joshua Faires (joshua.faires@yale.edu).

STEM NAVIGATORS

STEM Navigators is a light-touch mentoring program that helps inform students about success strategies and opportunities in STEM. This program is designed to help first-

and second-year Yale undergraduates negotiate their early STEM courses, research, and other opportunities. Each week, participants receive an email from their STEM Navigator mentor that highlights STEM-related activities and advice. Students may also request to meet one-on-one with their assigned mentor. For more information, contact Karin Gosselink (karin.gosselink@yale.edu).

DISABILITY PEER MENTOR PROGRAM

The Disability Peer Mentor Program offers students with disabilities and neurodiverse students peer mentorship and access to professional learning support. It offers academic and other support programming for students with disabilities, including physical disabilities, learning differences, temporary disabilities, chronic illness, mental illness, and sensory disabilities. Students can meet with our staff Learning Specialist, Geoffrey Canales, to discuss how to adjust their existing learning strategies to the demands of pursuing college-level work with a disability. We also offer support groups for students with ADHD and chronic illness and one-on-one peer mentoring through the Disability Peer Mentor Program. For more information, or to refer a student to disabilities support, please contact Geoffrey Canales (geoffrey.canales@yale.edu).

Center for Language Study

The Center for Language Study (CLS), provides resources for language study at Yale. The CLS also provides support for speakers of other languages through its English Language Program. For undergraduates enrolled in a language course, the CLS offers peer tutoring in the target language. Students who seek to demonstrate advanced- or native-level proficiency in a language not taught at Yale may contact the CLS for a proficiency assessment, ideally during their first year. For students in Yale College and in the graduate and professional schools, the CLS offers specialized language programs such as Directed Independent Language Study (DILS) for the study of languages not taught at Yale, and the Fields program for discipline-specific language study at advanced levels. For professional school students, the CLS offers courses in language for special purposes, such as Spanish or Chinese for medical professionals. All language learners at Yale have access to CLS facilities, including its study rooms, distance facilities, and flexible learning spaces. For more information, including hours, a list of resources, and information about Yale's foreign language requirement and placement testing, see the Center website.

Student Accessibility Services

To ensure that all students have an equal opportunity to make the most of their Yale education, the Student Accessibility Services Office (SAS) facilitates individual accommodations for students with disabilities. SAS promotes equitable access to education and student life for students with disabilities and fosters a campus environment of belonging, inclusion, and respect. Students requesting accommodations should complete an Accommodation Request form to initiate the interactive process. Engagement with SAS is confidential. Generally, a student requiring reasonable accommodations needs to renew accommodations with SAS at the start of each term and should complete this step as soon as their schedule is finalized. At any time during a term, students with a newly diagnosed disability or recently sustained

injury requiring accommodations should contact SAS to discuss accommodation options. SAS may be reached at sas@yale.edu or by phone at (203) 432-2324.

Special Programs

DIRECTED STUDIES

Directed Studies (DS), a selective program for first-year students, is an interdisciplinary introduction to influential texts that have shaped many Western and Near Eastern traditions, spanning from cultures in the Ancient Mediterranean to the present. Consisting of three integrated full-year courses in literature, philosophy, and historical and political thought, Directed Studies provides a coherent program of study that encourages students to put rich and complex texts into conversation with one another across time and disciplinary boundaries. From day one to the end of their first year, students in Directed Studies engage in critical thinking through learning to analyze challenging and urgent texts, participate meaningfully in seminar discussions, and write clear and persuasive analytic essays. Directed Studies has no prerequisites and provides a strong foundation for any major. Approximately eight percent of the first-year class is admitted each year to the program, which also satisfies Yale College distribution requirements in Humanities and Arts (HU), Social Sciences (SO), and Writing (WR). Students entering the program must enroll in all three courses and are expected to enroll for both semesters. Students participating in DS become members of a close-knit and supportive intellectual cohort that endures well beyond the end of the first year. Additional information is available on the program website.

THE DEVANE LECTURES

The DeVane Lectures are a special series of lectures that are open to the general public as well as to students and to other members of the Yale community. They were established in 1969 in honor of William Clyde DeVane, Dean of Yale College from 1939 to 1963. Details of the course are listed under DeVane Lecture Course in Subjects of Instruction. Supplementary meetings will be held for those students taking the lectures for credit.

FACULTY-LED ENSEMBLES

Yale's faculty-led performing ensembles offer qualified Yale students the opportunity to enhance their academic experiences through participation in the Yale Concert Band, Glee Club, Jazz Ensembles, and Symphony Orchestra. In addition to the preparation and performance of state-of-the-art music, participation in these ensembles provides opportunities to learn about the fine arts and their place in society and international cultures, and develop skills to become leaders in the arts. Through a robust series of activities (including international tours), students will work with and may become advanced performers, conductors, composers, arrangers, writers, archivists, historians, photographers, producers, media producers, critics, and teachers. Admission to ensembles is by audition, and participating students should enroll in the relevant Music department course affiliated with the ensemble each term. Some instruments are available for semester-long loans (see ensemble websites).

FIRST-YEAR SEMINAR PROGRAM

The First-Year Seminar Program offers a diverse selection of courses for first-year students, designed to support their transition to college-level learning. Seminars are limited to between fifteen and eighteen students depending on the course, and most meet twice a week. Unless otherwise noted, these courses do not require prior experience in the field. Each year, approximately 100 first-year seminars are offered across a wide range of subjects in both fall and spring terms. Students apply for these seminars during registration. Students may only enroll in one first-year seminar per term, with a maximum of two during their first year at Yale College. Special permission is required for exceptions which must be approved by the Director of the First-Year Seminar Program (jasmina.besirevic@yale.edu). Auditing is not permitted in first-year seminars. More details on the program and application procedures are available on the program website.

FRANCIS WRITER-IN-RESIDENCE

The Francis Writer-in-Residence in Yale College is a distinguished writer of nonfiction who teaches either one or two courses each academic year. The instructor is actively engaged with undergraduate life and serves as an academic mentor through seminars, readings, meetings with students, and other activities.

RESERVE OFFICERS TRAINING CORPS (ROTC)

Yale hosts Naval and Air Force ROTC programs, which offer qualified Yale College students an opportunity to pursue their regular Yale degrees while also preparing for leadership positions in the United States Air Force, Space Force, Navy, or Marine Corps. Regardless of financial need, participating students may receive significant help in meeting the costs of a Yale education through national scholarships offered by each branch of ROTC. While most ROTC students in Yale College earned a scholarship while in high school, any student may enroll in ROTC courses and apply to join ROTC during their first year or sophomore year. Further information about the Air Force ROTC program can be found on the Yale AFROTC website or under Aerospace Studies in Subjects of Instruction. Further information about the Naval ROTC program (including the Marine Corps program) can be found on the Yale NROTC website or under Naval Science in Subjects of Instruction. Yale College students can participate in Army ROTC through a crosstown arrangement at the University of New Haven. Students not matriculated at Yale who are participating in the Air Force ROTC program as part of a crosstown arrangement are subject to Yale College's *Undergraduate Regulations*.

RESIDENTIAL COLLEGE SEMINARS

Established in 1968, the Residential College Seminar Program fosters innovative courses that extend beyond traditional departmental structures. Seminar instructors come from both the University community and the broader region, including writers, journalists, artists, legal scholars, public health experts, and participants in government and the public sector. The program encourages creative course development, with student committees in the residential colleges playing a key role in selecting the seminars. However, all courses must meet Yale College's academic credit standards and receive approval from the appropriate faculty committees overseeing the curriculum. Each residential college sponsors at least one seminar per term, and

additional seminars may occasionally be offered by the program itself. Students apply to residential seminars during registration. Students from the sponsoring college have priority admission to the first six roster spots in each seminar, but students from any college may enroll. Students may apply to no more than two college seminars in a given term and may only enroll in one college seminar per term, with a maximum of four college seminars in their Yale College career. Exceptions to enrolling in more than one residential college seminar per term require special permission from the Director of the Residential College Seminar Program (jasmina.besirevic@yale.edu) and from the Yale College Committee on Honors and Academic Standing for more than four such seminars in total. Auditing is not permitted in college seminars. Course descriptions and further details can be found on the program website.

RITVO-SLIFKA WRITER-IN-RESIDENCE

Ritvo-Slifka Writer-in-Residence in Yale College is an emerging or mid-career professional writer, chosen from fiction writers, playwrights, critics, journalists, screenwriters, essayists, and poets. Both as a fellow of a residential college and as an instructor of one or two courses in each academic year, the Ritvo-Slifka Writer-in-Residence meets formally and informally with students through classes, through the one-on-one advising of creative writing projects, and through readings and extracurricular activities.

ROSENKRANZ WRITER-IN-RESIDENCE

The Rosenkranz Writer-in-Residence in Yale College is a distinguished professional writer, chosen from fiction writers, playwrights, critics, journalists, screenwriters, essayists, poets, and social commentators. Both as a fellow of a residential college and as an instructor of one or two courses in each academic year, the Rosenkranz Writer-in-Residence meets formally and informally with students through classes and through readings and extracurricular activities.

STUDIES IN GRAND STRATEGY

Studies in Grand Strategy is a two-semester, calendar-year interdisciplinary seminar. The class investigates methods and materials for teaching and understanding grand strategy as a historical concept and as an active approach to geopolitics, statecraft, and social change. Each course, worth one credit, emphasizes connections between history and strategy, scholarship and real-world practice, leadership, and citizenship. The two-term seminar aims to educate students intending to pursue careers in a wide variety of fields and is part of the Brady-Johnson Program in Grand Strategy. Additional information can be found on the program website.

YALE JOURNALISM INITIATIVE

The Yale Journalism Initiative (YJI) empowers Yale students to pursue careers in journalism by bridging the gap between Yale's academic instruction and the dynamic–often opaque–world of professional journalism. The YJI team provides career guidance, organizes events with distinguished journalists, and offers programming to support students in their journalistic ambitions. YJI also provides internship funding to students who complete Yale's advanced journalism seminar, ENGL 4460. The seminar is open to undergraduates and select graduate and professional students; application is required through the English department's selection process for creative writing classes.

Students who complete the seminar may apply to become Yale Journalism Scholars, a distinction that denotes a deep commitment to the craft of journalism. For more information on the initiative or on becoming a Journalism Scholar, see the Journalism Initiative website.

Honors

GENERAL HONORS

The bachelor's degree *cum laude*, *magna cum laude*, or *summa cum laude* is awarded at graduation on the basis of a student's general performance in courses taken at Yale. At Commencement, General Honors are awarded to no more than 30 percent of the class. The bachelor's degree is awarded *summa cum laude* to no more than the top 5 percent of the graduating class, *magna cum laude* to no more than the next 10 percent of the graduating class, *cum laude* to no more than the next 15 percent of the graduating class. Eligibility for General Honors is based on the grade point average (GPA) earned in courses taken only at Yale, with letter grades carrying the following values:

A 4.00	B– 2.67	D+ 1.33
A– 3.67	C+ 2.33	D 1.00
B+ 3.33	C 2.00	D– 0.67
B 3.00	C– 1.67	F 0.00

Marks of CR in courses taken on a Credit/D/Fail basis are not included in the calculation of grade point averages. Marks of W, for Withdrawal, carry no course credit, and do not figure in a grade point average.

DISTINCTION IN THE MAJOR

Distinction in the Major is conferred at graduation on any senior who, on nomination by the student's department or program, and with the concurrence of the Committee on Honors and Academic Standing, merits such an award for the quality of work completed in the major subject.

Distinction is awarded to students who have earned grades of A or A– in three-quarters of the credits in the major subject or program and who have earned a grade of A or A– on the senior departmental examination, senior essay, or senior project. All courses taken for the major are included in these calculations for Distinction in the Major. Grades of F and marks of CR in courses taken Credit/D/Fail are included as non-A grades. Marks of W, for Withdrawal, which carry no course credit, and marks of P, for Pass, do not figure in the calculation for Distinction.

PHI BETA KAPPA

Election to Phi Beta Kappa is based on the percentage of grades of A earned at Yale. Marks of CR in courses taken Credit/D/Fail are counted as non-A grades. Marks of P in courses that are graded only on a Pass/Fail basis, such as independent study courses, are not included in the calculations. Marks of W, for Withdrawal, carry no course credit, and do not figure in the calculation for Phi Beta Kappa. Grades earned outside Yale, including those earned during study abroad other than at Yale in London, are also

not included in the calculation. Further information about the criteria for election and about the Yale chapter can be found on the Yale Phi Beta Kappa website.

PRIZES

For a list of the numerous prizes open annually to students in Yale College, consult the Yale Prizes website.

INTERRUPTION OR TEMPORARY SUSPENSION OF UNIVERSITY SERVICES OR PROGRAMS

Certain events that are beyond the university's control may cause or require the interruption or temporary suspension of some or all services and programs customarily furnished by the university. These events include, but are not limited to, epidemics or other public health emergencies; storms, floods, earthquakes, or other natural disasters; war, terrorism, rioting, or other acts of violence; loss of power, water, or other utility services; and protest disruptions, strikes, work stoppages, or job actions. In the face of such events, the university may provide substitute services and programs, suspend services and programs and/or issue appropriate refunds. Such decisions shall be made at the sole discretion of the university.

II. ACADEMIC REGULATIONS

Academic Regulations

As a condition of enrollment in Yale College, every student is required to comply with the academic regulations. Students are expected to familiarize themselves with these regulations, and an assertion of ignorance of their provisions cannot be accepted as a basis for an exception to them. No student or group of students should expect to be warned individually to conform to any of the regulations contained in this publication. Students are advised to pay special attention to all deadlines given in the academic regulations, which are strictly enforced. Students who have questions or concerns about these regulations should consult with their residential college dean.

A. Requirements for the B.A. or B.S. Degree

To qualify for the bachelor's degree, B.A. or B.S., a student must successfully complete thirty-six term courses in Yale College or their equivalent. In doing so, the student must fulfill the distributional requirements of Yale College and the requirements of a major program. A student may normally complete no more than eight terms of enrollment in order to fulfill these requirements.

Yale College expects regular classroom attendance of all students. Accordingly, during terms in which undergraduates are enrolled and instruction is provided in-person, they may not be away from campus for a period exceeding two continuous weeks (14 calendar days) of class time without receiving advance permission from the Committee on Honors and Academic Standing. Students considering such a period of absence should contact their residential college dean at the earliest opportunity.

During the terms that students are enrolled and in residence in Yale College, they cannot be simultaneously enrolled, either full-time or part-time, in any other school or college at any other institution, with the exception of other Yale University schools that permit currently enrolled undergraduates to be admitted to programs that have been established within Yale College. Examples of such programs include the simultaneous award of the bachelor's and master's degree and the five-year B.A.-B.S/M.P.H. degree program in Public Health. Exceptions will also be made for Yale College students whose participation in the Reserve Officers Training Corps program requires enrollment in courses offered outside of Yale.

Students enrolled in the Eli Whitney Students program should consult section N, Eli Whitney Students Program.

Students who have already earned a bachelor's degree at Yale or at another institution are not eligible for degree enrollment in Yale College.

DISTRIBUTIONAL REQUIREMENTS

All students in Yale College must fulfill distributional requirements in order to qualify for the bachelor's degree. For a general introduction to the distributional requirements and a definition of the disciplinary areas and skills categories, refer to The Undergraduate Curriculum.

Students may meet the first-year and sophomore distributional milestones through *enrollment*, meaning that the course remains on the student's record in any form—with a "CR", a "W" ("Withdrew after Midterm"), an "F", or a passing letter grade. Students must, however, earn passing letter grades to fulfill their junior and senior distributional requirements.

1. Distributional requirements for the first, sophomore, and junior years Students must partially fulfill the distributional requirements during the first, sophomore, and junior years in order to be eligible for promotion. First-years and sophomores earn the distributional designation assigned to a course as long as they remain in the course beyond the midterm.

Distributional requirements for the first year Students must have enrolled for at least one course credit in two skills categories by the end of the second term of enrollment in order to be eligible for promotion to sophomore standing.

Students may elect no more than four course credits in a single department, and no more than six course credits in a single disciplinary area, except that a student taking a laboratory course may elect as many as seven course credits in the sciences.

Note that credit from outside Yale may not be applied toward the distributional requirements for the first year; accordingly, students who are permitted by the Committee on Honors and Academic Standing to repair a deficiency in these requirements over the summer following their first year must do so by means of enrollment in Yale Summer Session.

Distributional requirements for the sophomore year Students must have enrolled for at least one course credit in each of the three disciplinary areas and for at least one course credit in each of the three skills categories by the end of the fourth term of enrollment in order to be eligible for promotion to junior standing.

Distributional requirements for the junior year Students must have completed all of their skills requirements, and must have earned at least one course credit in each of the three disciplinary areas, by the end of the sixth term of enrollment in order to be eligible for promotion to senior standing.

2. Multiple distributional designations Although some courses may carry more than one distributional designation, a single course may be applied to only one distributional requirement. For example, if a course is designated both Hu and So it may be applied toward either the humanities and arts requirement or the social science requirement, but not both. Similarly, if a course is designated QR and Sc, it may be applied toward either the quantitative reasoning requirement or the science requirement, but not both.

A course with multiple distributional designations, once applied toward one distributional requirement, may subsequently be applied toward a different distributional requirement. The University Registrar's Office regularly optimizes the use of each student's completed courses toward fulfillment of the distributional requirements.

3. Language distributional requirement All students are required to engage in the study of a language while enrolled in Yale College.

Students who matriculate at Yale with no previous language training must complete three terms of instruction in a single language. This requirement is fulfilled by the completion of courses designated L1, L2, and L3.

Students who have taken the Advanced Placement examination or the International Baccalaureate higher-level examination in world languages should consult the Subjects of Instruction for each department's placement procedures.

Students who have studied a language before matriculating, but have not taken the Advanced Placement or the International Baccalaureate higher-level examination in that language, must take a placement exam offered by the appropriate language department or, for languages in which no departmental placement exam is offered, consult the appropriate director of undergraduate studies (DUS). The departmental test determines whether students place into the first, second, third, or fourth term of language study (courses designated L1, L2, L3, or L4), or whether they qualify for language courses beyond the fourth term of study (L5).

Students who place into the first term of a language must successfully complete three courses in that language, designated L1, L2, and L3.

Students who matriculate at Yale able to place into the second term of a language must successfully complete three courses in that language, designated L2, L3, and L4. Alternatively, they may successfully complete three courses in a different language at least through the level designated L3.

Students who matriculate at Yale able to place into the third term of a language must successfully complete two courses in that language, designated L3 and L4. Alternatively, they may successfully complete two or more courses in a different language at least through the level designated L3.

Students who matriculate at Yale able to place into the fourth term of a language must successfully complete one course in that language, designated L4. Alternatively, they may successfully complete one or more courses in a different language at least through the level designated L3. Students who have taken the Advanced Placement examination in world languages, and who present scores of 5, or who present scores of 6 or 7 on the International Baccalaureate higher-level examination, but who place into the L4 level on the Yale placement exam may fulfill the language requirement by successfully completing one course in the placement language at the level designated L4, or one or more courses in a different language at least through the level designated L2.

Students who matriculate at Yale able to place into the fifth term of a language must successfully complete one course in that language, designated L5 or a comparable course at the DUS's discretion. Alternatively, they may successfully complete one or more courses in a different language at least through the level designated L2.

Students whose secondary school transcript shows that the language of instruction was other than English, or who otherwise can demonstrate native proficiency in a language other than English through an assessment at the Center for Language Study, may fulfill the language requirement by successfully completing ENGL 1014, 1015, 1020, 1021, or 3450. Alternatively, students in this category may fulfill the requirement by successfully completing one course in their native language designated L5 or a comparable course at the DUS's discretion, or by successfully completing one or more courses in a third

language, neither English nor the language of their secondary school instruction, at least through the level designated L2.

In order to promote firsthand experience in other cultures and the learning of language in real-world settings, students are permitted to apply toward the satisfaction of the language requirement the completion of an approved study abroad program in a non-English language speaking setting if they have first completed or placed out of a language course designated L2. Students seeking to undertake study at another institution or program for this purpose must consult the relevant DUS in advance of their proposed study for advice about appropriate programs and courses and for information about the approval process. See section P, Credit from Other Universities.

Introductory (L1/L2) language courses, whether taken on a Yale Summer Session Program Abroad or on an approved non-Yale study abroad program, are eligible for credit toward the 36-course-credit requirement, the language requirement, and major requirements.

Study abroad opportunities are described under International Experience in The Undergraduate Curriculum. Intensive language courses provide the equivalent of a full year of instruction in a single term. A course designated L1–L2 fulfills both the L1 and the L2 levels of the language distributional requirement. Similarly, a course designated L3–L4 satisfies both the L3 and the L4 levels.

Not all of the languages offered in Yale College are offered at all levels, and it may not be possible to fulfill the language requirement in some of them. Languages currently offered in Yale College are Akkadian, American Sign Language, Arabic, Armenian, Bosnian-Croatian-Serbian, Burmese, Cherokee, Chinese, Czech, Dutch, hieroglyphic Egyptian, Finnish, French, German, ancient Greek, modern Greek, biblical Hebrew, modern Hebrew, Hindi, Hungarian, Indonesian, isiZulu, Italian, Japanese, Khmer, Kiswahili, Korean, Latin, Persian, Polish, Portuguese, Punjabi, Romanian, Russian, Sanskrit, Sinhala, Spanish, Tamil, classical Tibetan, modern Tibetan, Turkish, Twi, Ukrainian, Vietnamese, Wolof, Yiddish, and Yorùbá. Students wishing to fulfill the language requirement in a less commonly taught language should consult the DUS in the relevant department to verify that the appropriate level of study will be offered. Students who have intermediate- or higher-level proficiency in a language other than those listed here should consult the appropriate DUS or the director of the Center for Language Study to arrange for a placement examination.

Students who, for medical reasons, are not able to complete the language requirement may petition the Committee on Honors and Academic Standing for a partial waiver of the requirement. In granting such a waiver, the committee will normally require that a student complete four course credits in the study of a specific non-English-speaking culture.

For a chart showing the most common paths toward fulfillment of the language requirement, see the Center for Language Study page.

4. Courses taken on the Credit/D/Fail basis A student may not apply any course credit earned on the Credit/D/Fail basis toward satisfaction of the distributional requirements for the junior year nor for the distributional requirements for the bachelor's degree. An exception is made for the language requirement: while students must earn a passing

letter grade in the final course in the L1-L5 language series, they may apply grades of CR to the earlier courses in that series. For instance, a student who completes the L1-L3 series may earn grades of CR in their L1 course and/or their L2 course, but they must earn a passing letter grade in their L3 course to fulfill this requirement.

5. Independent study courses A student may not apply any course credit earned through independent study courses toward the satisfaction of any of the distributional requirements. Students considering enrollment in Yale graduate or professional schools should carefully review the relevant entry in section L, Special Academic Arrangements, "Courses in the Yale Graduate and Professional Schools."

6. Acceleration credits Acceleration credits may not be employed to satisfy the distributional requirements for the bachelor's degree, nor may they be employed to meet the distributional requirements for the first, sophomore, or junior years.

7. Course credit earned at Yale before admission Course credit earned in Yale Summer Session before a student's admission to Yale College, or in the Non-degree Students program while the student was enrolled as a secondary school student in the New Haven area, may be applied to the distributional requirements for the bachelor's degree and to those for the first, sophomore and junior years.

8. Courses in the graduate and professional schools It is the expectation that Yale College students, including candidates for the simultaneous award of the bachelor's and master's degrees, will fulfill their distributional requirements in courses taken in Yale College. Credit earned in a course offered in the Graduate School of Arts and Sciences or in one of the professional schools of the University may be applied toward the distributional requirements only if the course instructor has secured, in advance of the term in which the course will be given, approval from Yale College. Instructors interested in making such an advance arrangement can contact the Dean of Academic Affairs to be directed to the appropriate authority for such approval.

9. Course credit from outside Yale Course credit earned at another university may be applied toward the distributional requirements for the bachelor's degree and to those for the sophomore and junior years whether or not it is counted toward the 36-course-credit requirement for graduation. Credit from outside Yale may not be applied toward the distributional requirements for the first year. See section P, Credit from Other Universities. Note particularly that Yale does not award course credit or distributional credit for courses completed at another college or university before the student graduated from secondary school.

10. Major programs Courses taken in fulfillment of a student's major requirements may be applied toward satisfaction of the distributional requirements for the first, sophomore, and junior years and toward the distributional requirements for the bachelor's degree.

11. Permission for a partial waiver of the distributional requirements for the first year If, with the permission of the residential college dean, a first-year student enrolls in a program of study for the first two terms of enrollment worth more than nine course credits, the dean may waive the year limit on the number of course credits that a student may elect in a single department or disciplinary area.

In rare circumstances, a student may petition to postpone their first-year distributional requirements to the third term. Such a petition should explain the sound academic reasons why these requirements cannot be satisfied within two terms of enrollment and give an exact description of how they will be fulfilled in the third term.

12. Permission to postpone fulfillment of the distributional requirements for the sophomore year A student may petition the Committee on Honors and Academic Standing for permission to fulfill the distributional requirements for the sophomore year in the fifth term of enrollment. Such a petition should explain the sound academic reasons why these requirements cannot be satisfied within four terms of enrollment and give an exact description of how they will be fulfilled in the fifth term. Students who have not fulfilled the distributional requirements for the sophomore year by the end of the fourth term of enrollment and who have not been granted permission by the Committee on Honors and Academic Standing to postpone their fulfillment will normally not be promoted to junior standing.

13. Permission to postpone fulfillment of the distributional requirements for the junior year In exceptional circumstances, a student may petition the Committee on Honors and Academic Standing for permission to fulfill the distributional requirements for the junior year in the seventh term of enrollment. Such a petition, which must include the written support of the residential college dean and, where applicable, that of the DUS in the student's major, should be filed no later than the date on which the student's course schedule is due in the sixth term of enrollment. It should explain the sound academic reasons why these requirements cannot be satisfied within six terms of enrollment and give an exact description of how they will be fulfilled in the seventh term. Students who have not fulfilled the distributional requirements for the junior year by the end of the sixth term of enrollment and who have not been granted permission by the Committee on Honors and Academic Standing to postpone their fulfillment will normally not be promoted to senior standing.

MAJOR REQUIREMENTS

The requirements of the various major programs are given under the heading for each department or program. Every major program includes a senior requirement, which may take the form of a senior essay, a senior project, or a senior departmental examination.

EIGHT TERMS OF ENROLLMENT

A student must complete the requirements for the bachelor's degree in no more than eight terms of enrollment. Terms spent on a Year or Term Abroad, or in the Yale College program at the Paul Mellon Centre in London during a spring term, are considered the equivalent of terms of enrollment in Yale College. Note, however, that course credits earned in terms spent on a Year or Term Abroad may not be applied to acceleration by the early accumulation of thirty-six course credits all earned at Yale. See section Q, Acceleration Policies. (Attendance at the summer program at the Paul Mellon Centre in London or Yale Summer Session does not constitute a term of enrollment in Yale College.)

In exceptional circumstances, a student may petition the Yale College Committee on Honors and Academic Standing for permission to enroll for an additional term. Such a petition should be made no later than the beginning of a student's seventh term of

enrollment; it should describe precisely, giving detailed information on specific courses, why it is impossible for the student to complete the requirements for a bachelor's degree within eight terms; and it should be accompanied by detailed, informative letters of endorsement from the student's DUS and residential college dean. When the request is being made in whole or in part on medical grounds, documentation must be provided by a treating physician or therapist, by Student Accessibility Services, or by both. The Committee on Honors and Academic Standing cannot grant permission for a ninth term in order for a student to undertake an optional arrangement not necessary for the acquisition of a bachelor's degree, such as, for example, the completion of two majors, or enrollment in the Program for the Simultaneous Award of the Bachelor's and Master's Degrees, or completion of the entrance requirements for graduate or professional school. Students who have been permitted to take a reduced course load may be granted a tenth term of enrollment. A student given permission to enroll for a ninth or tenth term is eligible for scholarship assistance from Yale as in the student's previous terms. See "Financial Services" under "Regulations" in the Yale College online publication Undergraduate Regulations.

Graduation in fewer than eight terms of enrollment is possible: see section Q, Acceleration Policies. Under no circumstances may a student graduate in fewer than six terms of enrollment, unless the student was admitted by transfer from another college or university. Transfer students should consult section M, Transfer Students. Eli Whitney students should consult section N, Eli Whitney Students Program.

B. Grades

LETTER GRADES

The letter grades in Yale College are:

A	Excellent	B+		C+		D+		F	Fail		
A–		B	Good	C	Satisfactory	D	Passing				
		B–		C–		D–					

Undergraduates who enroll in graduate school courses are assigned letter grades (A-F).

CREDIT/D/FAIL OPTION

The opportunity to elect courses on a Credit/D/Fail basis has been provided by the Yale College Faculty in order to encourage academic exploration and to promote diversity in students' programs.

1. **Reporting of grades** In all courses (except for some professional school courses), instructors report letter grades for all students. If the student has chosen the Credit/D/Fail option in a course, the registrar converts grades of A, A–, B+, B, B–, C+, C, and C– into the notation CR, which is entered on the student's transcript. Grades of D+, D, D–, and F are entered on the transcript as reported. A student may not be required to disclose to the instructor of a course whether the student has enrolled in the course for a letter grade or under the Credit/D/Fail option.
2. **Eligibility** All courses, other than independent study courses, that are offered in Yale College during the fall and spring terms are available for election under the

Credit/D/Fail option. (See "Independent Study Courses," below, for information on the grading of such courses.)

3. **Total number of course credits** A student has up to six opportunities to convert a course credit to the Credit/D/Fail option, with two of these opportunities expiring if unused during their first two terms of enrollment. Note that some courses earn .5 credits and some earn 1.5 credits. If, however, a student earns a D or F grade in a course taken under the Credit/D/Fail option, that course will not count toward this six course credit limit.
4. **Number of courses and course credits in a term** As many as two course credits may be elected under the Credit/D/Fail option in a term; thus in an academic year a student may earn as many as four course credits on the Credit/D/Fail option. In each term, a student must elect at least two courses, representing at least two course credits, earning letter grades of A-F or marks of Pass/Fail. For students enrolled in the Eli Whitney Students program, who are permitted to enroll in as few as three course credits in a calendar year and thus sometimes enroll in only one course credit in a term, different limits apply. An Eli Whitney student enrolled in four or more course credits in a term may elect up to two course credits that term under the Credit/D/Fail option; an Eli Whitney student enrolled in three or 3.5 course credits in a term may elect up to 1.5 course credits that term under the Credit/D/Fail option; and an Eli Whitney student enrolled in two or 2.5 course credits in a term may elect up to one course credit that term under the Credit/D/Fail option. An Eli Whitney student who is enrolled in fewer than two course credits in a term may elect no course credits that term under the Credit/D/Fail option. An Eli Whitney student who is enrolled in two or more but fewer than four course credits in a term may elect no more than one course credit that term under the Credit/D/Fail option. An Eli Whitney student who is enrolled in four or more course credits in a term is bound by the limits given in the paragraph immediately above.
5. **Distributional requirements** A student may not apply any course credit earned with a grade of Credit (CR) toward satisfaction of the distributional requirements for the junior year, or toward satisfaction of the distributional requirements for the bachelor's degree. An exception is made for the language requirement: while students must earn a passing letter grade in the final course in the L1-L5 language series, they may apply grades of CR to the earlier courses in that series.
6. **Requirements of the major** The program description of each major specifies whether or not courses taken on the Credit/D/Fail basis count toward the requirements of that major.
7. **Credit/year course sequences** A credit/year course sequence may be taken under the Credit/D/Fail option for one term while the other term of the yearlong sequence is taken for a letter grade. For credit/year course sequences in which a student receives a separate letter grade for each of the two terms, each term will be governed by the enrollment option the student elected for that term. For credit/year course sequences in which a student receives the mark of SAT or NSAT for the first term and a letter grade for the second, the enrollment option that the student elects for the second term governs both terms of the course sequence; that is, students will receive either the mark of CR for both terms or a letter grade for both terms, depending on the option elected for the second term.

8. **Course schedules** Students enroll in all courses without selecting any for the Credit/D/Fail option. They may subsequently select that option in any Yale College course—other than those independent study courses graded on a Pass/Fail basis—by the last day of classes, as published in the Yale College Calendar with Pertinent Deadlines. After the last day of classes, election of the Credit/D/Fail option is not permitted. As indicated above, in a given term a student may elect as many as (but no more than) two course credits on the Credit/D/Fail basis; and must elect at least two courses, representing at least two course credits, for letter grades or the mark of Pass/Fail, in any combination.
9. **Conversion back to a letter grade** Once a student converts a course to the Credit/D/Fail mode, this change cannot be reversed.
10. **Acceleration credit** Work completed under the Credit/D/Fail option cannot yield acceleration credit.
11. **Prizes and honors** Marks of CR are included as non-A grades in the calculations for some prizes, for Distinction in the Major, and for election to Phi Beta Kappa, but marks of CR are not included in the calculation for General Honors. See Honors in The Undergraduate Curriculum.
12. **Courses in the graduate and professional schools** Courses in the Graduate School of Arts and Sciences and in the professional schools of the University are not available on the Yale College Credit/D/Fail option. Some courses in certain professional schools of the University are, however, graded on a SAT/NSAT, Pass/Fail, Credit/Fail, or Credit/No Credit basis, and grades for undergraduates in these courses are recorded as Pass/Fail. Such credits are counted in the total offered toward the requirements of a bachelor's degree. Marks of "P" or Pass in professional school courses are included in the calculations for Distinction in the Major as non-A grades. Marks of "P" or Pass in professional school courses are not included in the calculation for General Honors. See "General Honors" and "Distinction in the Major" under Honors in The Undergraduate Curriculum.

INDEPENDENT STUDY COURSES

Independent study courses, other than senior essays or projects and other exempted courses as explained below, are graded on a Pass ("P")/Fail ("F") basis, with the additional requirement that the instructor of record submit a substantive report that both describes the nature of the independent study and evaluates the student's performance in it. These reports will be shared with the student and the director of undergraduate studies (DUS) in the department or program in which the course is offered, and kept in the office of the student's residential college dean.

Senior projects and courses deemed by a department or program to be a constituent of the senior requirement are evaluated with a letter grade. Additionally, the department or program offering a particular independent study course may deem that such a course should be exempted from Pass/Fail grading for a particular student because the course meets an important requirement in the major. In such a case, the DUS in the department or program that will be applying the course toward its major requirements may petition the Committee on Honors and Academic Standing to permit the student's work in the course to be evaluated with a letter grade. Such a petition should be filed by the end of add/drop period in the term in which the student is enrolling in the course

and should provide sound academic reasons for the exception. Such petitions may not be accepted after the date of midterm in the term in which the course is being taken.

GENERAL REGULATIONS CONCERNING GRADES AND TRANSCRIPTS

1. **Record of courses** A transcript is the record of courses in which a student has enrolled during the student's progress in completing the requirements of the bachelor's degree. All grades appear on the transcript, but not all grades are counted in the calculation of grade point average (GPA). These include passing grades earned in the first term of a credit/year course sequence in which the second term is not completed. If a student remains in a course after the date of midterm, the student is considered to have been enrolled in that course; therefore, if a student withdraws from the course after midterm and before the first day of the reading period, the mark of W (Withdrew) appears on the transcript in association with the course. See paragraph 4 below.
2. **Equal value of courses** Passing grades contribute equally, to the extent to which they carry course credit, toward the 36-course-credit requirement for graduation. A grade of D in a course, for example, does not need to be balanced with a higher grade in some other course.
3. **Change of a grade** A grade, once submitted by the instructor of a course to the registrar, may not be changed except by vote of the Yale College Committee on Honors and Academic Standing on petition of the instructor, unless it is the result of a clerical error made in the instructor's computation or in transcription of a grade.
4. **Deadlines for withdrawal from courses** If a student has elected a full-term course on the course schedule but formally withdraws from it before midterm, as published in the Yale College Calendar with Pertinent Deadlines, the student's transcript will contain no indication of that course after the withdrawal has been recorded by the registrar. If a student has elected a half-term course on the course schedule but formally withdraws from it by the relevant deadline published in the Yale College Calendar with Pertinent Deadlines, the student's transcript will contain no indication of that course after the withdrawal has been recorded by the registrar. See section F, Withdrawal from Courses.

   If a student enrolled in a full-term course formally withdraws from it after midterm but before the first day of the reading period, the student's transcript will record the designation W (Withdrew) for the course. In credit/year course sequences in which a student receives the mark of SAT or NSAT for the first term and a letter grade for the second, a student who completes the first term but does not subsequently enroll in the second term, or who subsequently withdraws from the second term before the second term is completed, will have the designation W (Withdrew) recorded for the first term of the sequence.

   If a student enrolled in a half-term course formally withdraws from it after the deadline for the course to be removed from the transcript, but by the last date a withdrawal is permitted from the course, the student's transcript will record the neutral designation W (Withdrew) for the course. See the Yale College Calendar with Pertinent Deadlines for both dates in each term.

The mark of W is a neutral designation indicating simply that the student has been enrolled in, but has withdrawn from, a course; while the course carries no credit toward the degree, the W implies no evaluation of a student's work and carries no implication whatsoever of failure. Withdrawal from a course after the last day of classes, as published in the Yale College Calendar with Pertinent Deadlines, is not possible. See section F, Withdrawal from Courses.

5. **Incomplete work and postponed final examinations** A student who has received permission for a mark of Temporary Incomplete in a course, or who has been authorized to take a makeup final examination in a course, is allowed the specified period of time to repair the deficiency in the course. If the deficiency is not repaired by a satisfactory performance within the stipulated time, then the designation TI (Authorized Temporary Incomplete) or ABX (Authorized Absence from Final Examination) is automatically converted by the registrar to the grade of NM (no mark). See section H, Completion of Course Work, "Postponement of Final Examinations" and "Work Incomplete at the End of Term."
6. **Withdrawal from Yale College** Whether a student withdraws from Yale College for personal, academic, or financial reasons, the entry placed in each case on the student's transcript is the word "Withdrew" together with the date of the withdrawal. When a student is withdrawn for disciplinary reasons, the entry placed on the student's transcript is the word "Suspended" together with the date of the suspension.
7. **Majors, concentrations, and certificates** A transcript may show as a student's major subject only a designation approved for that purpose by the Yale College Faculty. Major designations are listed under Majors in Yale College. Additionally, transcripts show clearly defined major concentrations and certificates. Certificates are listed under Certificates in Yale College.
8. **Access to grades** Access to recorded grades is available online to students in any Yale College course for which they have completed or actively declined to complete the online course evaluation form through the Yale Hub. Students have the opportunity to grant online access to their grades to certain other parties through the Proxy Management menu in the Student Information System.

C. Course Credits and Course Loads

CREDIT VALUE OF COURSES

Most courses in Yale College are term courses that carry one course credit if completed with a passing grade. There are, however, some variations:

1. **Double-credit courses** Certain courses in Yale College, including intensive language or research courses, award two course credits for a single term's work.
2. **Yearlong course sequences** There are some yearlong course sequences in which two course credits are awarded upon the satisfactory completion of both terms of the sequence; other course sequences, including some research and laboratory courses, give one or four course credits for the successful completion of the full year's work. A student who fails the first term of a yearlong course sequence may continue the sequence only with the instructor's written permission and will receive course credit only for the successful completion of the second term's work. A student who satisfactorily completes the first term of a yearlong course

sequence may receive course credit routinely for that term's work, except where noted otherwise in the course listing.
The completion of the first term only of an introductory modern language earns credit whether or not a subsequent term of that language is completed. Neither instructors nor departments have the authority to make an exception to this rule.

3. **Laboratory courses** Some laboratory courses carry no separate credit toward the degree; others carry a full course credit for a term's work; and still others carry one-half course credit.
4. **Half-credit courses** All courses that carry 0.5 or 1.5 course credits and that are not bound by the credit/year restriction count toward the 36-course-credit requirement for the bachelor's degree.

NORMAL PROGRAM OF STUDY

A student in Yale College normally takes four or five term courses, or their equivalent, for each of eight terms.

1. **Minimum course load**

   a. Prior to midterm, a student must be enrolled in a program of study worth at least three course credits.

   b. After midterm and before the first day of reading period, a student may carry as few as two course credits by withdrawing from one or more courses and receiving the neutral designation W (Withdrew) in those courses. A student may not carry a schedule of courses that will earn fewer than two course credits and a W in a term.

   c. Note: In rare circumstances, urgent medical needs require that students take only two course credits. In such cases, and with the endorsement of Yale Health and Student Accessibility Services, as a reasonable accommodation, returning students (not first term students) may petition the Yale College Committee on Honors and Academic Standing, through their residential college dean's office, for permission to enroll in two course credits prior to the start of term or drop to two course credits at any point in the term while still remaining in good academic standing.

2. **Course loads requiring permission** A three-course-credit program of study or a six-course-credit program of study requires the permission of the residential college dean. It is assumed that any student who requests permission to carry six or more course credits does not intend to drop any of them. Permission for a program of six or more course credits will normally not be given to a student who is not in academic good standing.
3. **Seven course credits in a term** Students must petition the Yale College Committee on Honors and Academic Standing through their dean's office for permission to take a program worth seven credits in a term. In the petition, the student must explicitly state an intention to complete all the courses proposed.
4. **Independent study** Opportunities for independent study exist in many programs and departments under various designations: directed reading or research; individual reading or research; independent research or study; independent or special projects; individual instruction in music performance; independent,

individual, or special tutorials; and the senior essay or project, among others. Note that course credit earned in such study may not be used toward fulfillment of the distributional requirements, and students may not enroll in independent study courses in the graduate or professional schools. Students may not receive academic course credit for paid research assignments; they may not be paid for any work performed to meet academic requirements or that carries academic course credit. Approval for any such particular course is given by the department or program; however, approval for an independent study course is also required from the Yale College Committee on Honors and Academic Standing if certain limits are exceeded. A student must petition the Committee for permission to enroll in more than one such course credit in any one term before the senior year, or in more than two such course credits in any one term during the senior year. Permission is also required for a student to enroll in more than three such course credits in the first six terms of enrollment; included in this total are any independent study courses completed in Yale Summer Session that are applied to the Yale College transcript. In the petition, the student must give sound academic reasons for exceeding these limits, and provide evidence that the additional work in independent study will not be done at the expense of the breadth and depth of study being pursued in regular Yale College courses. MUSI 3245 and MUSI 4245 do not count toward the above limits on independent study enrollment.

Students admitted to the Program for the Simultaneous Award of the Bachelor's and Master's Degrees are not required to seek permission from the Committee on Honors and Academic Standing to enroll in independent study courses when that enrollment exceeds the limits above and such work is required for the completion of that program.

D. Promotion and Good Standing

REQUIREMENTS FOR PROMOTION

1. To be promoted to sophomore standing after two terms of enrollment, a student must have earned at least eight course credits or the equivalent and have fulfilled the distributional requirements for the first year.
2. To be promoted to junior standing after four terms of enrollment, a student must have earned at least sixteen course credits or the equivalent and is expected to have fulfilled the distributional requirements for the sophomore year.
3. To be promoted to senior standing after six terms of enrollment, a student must have earned at least twenty-six course credits or the equivalent and is expected to have fulfilled the distributional requirements for the junior year.

REQUIREMENTS FOR ACADEMIC GOOD STANDING

At the conclusion of each term of enrollment, a student must have earned enough course credits to be in academic good standing.

1. At the end of the first term at Yale, a student must have earned at least four course credits.
2. At the end of the second term, a student must have earned at least eight course credits.

3. At the end of the third term, a student must have earned at least twelve course credits.
4. At the end of the fourth term, a student must have earned at least sixteen course credits.
5. At the end of the fifth term, a student must have earned at least twenty-one course credits.
6. At the end of the sixth term, a student must have earned at least twenty-six course credits.
7. At the end of the seventh term, a student must have earned at least thirty-one course credits.

Regardless of the number of credits accumulated, a student is not in academic good standing if the student's record shows three grades of F in a term or over two or three successive terms. "Successive terms" means successive terms in which the student enrolls, whether or not broken by a withdrawal or by a leave of absence. See section I, Academic Penalties and Restrictions, "Dismissal for Academic Reasons" and "Makeup of Course Deficiencies for Promotion or Academic Good Standing." The term in which a student takes a medical leave of absence is not counted as a term of enrollment under this policy.

E. Course Enrollment

Students may enroll in courses only by entering courses onto their registration worksheet during the registration period, or during the add/drop period, according to the dates listed in the Yale College Calendar with Pertinent Deadlines. Class attendance does not constitute enrollment. The course schedule is an important record of a student's enrollment plans, and students are responsible for the timely and accurate entering and maintaining of course schedule information during the registration and add/drop periods. The course elections that a student indicates on a course schedule or course change notice will appear on the student's transcript unless the student formally withdraws from a course before the relevant deadline, as listed in the Yale College Calendar with Pertinent Deadlines. See section F, Withdrawal from Courses.

The following rules govern students' enrollment in courses during the fall and spring terms of the academic year:

1. **Registration period** For both fall and spring terms, all students must enroll in at least three course credits before the published deadline listed in the Yale College Calendar with Pertinent Deadlines. Continuing students enroll in the prior term; new and reinstated students are notified of their registration dates for the fall term and enroll for the spring term with continuing students.
2. **Add/drop period** At, or near, the beginning of each term, the registration system opens for all students to adjust their course enrollment. Final course selections and adjustments must be completed by the published deadline listed in the Yale College Calendar with Pertinent Deadlines. It is the student's responsibility to obtain all necessary permissions before the deadline.
3. **Addition of a new course after the add/drop period** The addition of a new course after the add/drop period is not permitted save by exceptional action of the Committee on Honors and Academic Standing. Students who seek an exception

should consult immediately with their residential college dean. Permission to elect a new course after the add/drop period must be requested by completing a course change notice that includes a petition and the written approval of the course instructor. The petition should explain in detail why the course is necessary to the student's schedule and why the student was unable to elect the course by the end of the add/drop period. Timeliness is an essential feature of any request to add a course to the course schedule; a delay in consulting with the dean or in submitting a complete petition is normally grounds for denial. A fee of $5 will be charged for the processing of an approved course change notice on which the election of a new course is requested. A student may not elect a new course after midterm, as published in the Yale College Calendar with Pertinent Deadlines, unless such election is made to correct a clerical error on the course schedule. A change of level in courses in which the subject is taught in an ordered progression, for example in languages or mathematics, is not considered the addition of a new course. Such a change may be made with the approval of the instructors involved (and, if necessary, with the added permission of the director of undergraduate studies in the subject). Similarly, a change of section in the same course is not considered the addition of a new course.

4. **Cross-listed courses** To comply with federal regulations, the University Registrar's Office does not retroactively adjust student records. Accordingly, students who are enrolled in cross-listed courses (e.g., courses with both a Graduate School and Yale College course number and/or courses taught in two or more different departments) must ensure that they are enrolled under the appropriate course number. The deadline to change school levels (Graduate School or Yale College) or departments is the last day of classes in the corresponding term of enrollment.
5. **Overlapping meeting times** A student may not elect courses with meeting times that overlap. If, for good cause, a student is obliged to elect two courses that overlap in meeting times, the student must supply the residential college dean at the beginning of the term with the written permission of both instructors, along with confirmation that the scheduled final exams as given in Yale Course Search do not themselves overlap. The student must also petition the Committee on Honors and Academic Standing, through their college dean's office, explaining why the student must enroll in both courses in the current term and how the student will meet all the requirements for both courses. No more than two courses may overlap, and the length of the overlap permitted depends on the course format as described below:

   (a) Two fully synchronous courses may have a small and insignificant overlap in meeting times (i.e., no more than 15 minutes once per week, including travel time), with permission from the instructors of both courses, via petition to the residential college dean, so long as the final exams do not overlap.

   (b) One partially synchronous course (e.g., a hybrid course with recorded lectures and in-person discussion sections) may overlap with one fully synchronous course, including for the full class meeting time stated in the course catalog, with the permission of both instructors, via petition to the residential college dean, so long as the final exams do not overlap. Note: all Yale College courses must

have weekly, in-person instruction, and so fully asynchronous courses are not permitted.

(c) Two partially synchronous courses, as defined above in (b), may overlap with each other, including for the full class meeting time, with the permission of both instructors, via petition to the residential college dean, so long as the final exams do not overlap.

Failure to file a complete and timely petition may result in the loss of credit for both courses.

6. **Courses requiring permission** Some courses require permission from the instructor to enroll; others require permission from the director of undergraduate studies. It is the responsibility of the student to secure the appropriate permission before they register in a course.

7. **Courses that do not require permission** Courses that do not require permission for enrollment may nevertheless be limited in their enrollment (i.e., "capped") at the beginning of the term, depending upon, for example, the number of teaching assistants available, the size of the appropriate meeting space, or other instructional needs.

8. **Prerequisites** Students are expected to have met the prerequisites published in course descriptions. If a student wishes to elect a course for which prerequisites are indicated but has not met those prerequisites, it is the student's responsibility to secure the permission of the instructor and, where appropriate, the director of undergraduate studies before enrolling. The registrar may drop the student from the class if the student has not met the prerequisites for enrollment.

9. **Teaching evaluations** For the advancement of teaching at Yale College, anonymous teaching evaluations are made available through Yale HUB. Students are expected to participate in this evaluation process for any eligible Yale College course in which they are enrolled. Students who withdraw from a course after midterm are invited but not required to participate.

10. **Selection of a less advanced course in the same subject** In certain subjects, such as mathematics, languages, and the sciences, knowledge of the subject is acquired in an ordered progression. That is, the concepts and skills introduced in one course are necessary, or prerequisite, for mastery of the material in subsequent courses in that field. Occasionally a student, having completed an intermediate or advanced course in a subject, may take a less advanced one in that same subject. In such a case, although the student cannot receive course credit for both courses, each course will appear on the student's transcript with the grades earned; however, the student will receive course credit only for the more advanced course. A student may sometimes be permitted to complete an intermediate or advanced course without having first completed a less advanced course in a subject; in such a case, the student does not receive course credit for the less advanced course by virtue of having completed the more advanced course.

11. **Repeated enrollment in the same course** Courses may not be repeated for credit, except for courses marked "May be taken more than once" or "May be repeated for credit." In such cases, the repeated course earns no additional distributional credit. On rare occasions, a student may take the same course over again, or may take a course with the same content as another course the student has already passed. In such cases,

the student receives credit for the course only once. Should a student take the same or an equivalent course twice, each course with its grade appears on the transcript. The student receives course credit for the higher grade if one is earned; in such an event, course credit is not given for the lower grade. Note, however, that both grades are included in the calculation of a student's grade point average (GPA) and in the calculation for General Honors.

12. **Academic credit and paid positions** Students may not receive academic course credit for paid research assignments; they may not be paid for any work performed to meet academic requirements or that carries academic course credit.

13. **Placement in language courses** Students placed by a language program or by their score on the Advanced Placement examination into a particular level of a language may not earn course credit for the completion of a course in that language at a level lower than the placement. For example, a student placed into the third term (L3) of a language earns no course credit for the completion of an L1 or L2 course in that language. Should a student complete a language course at a level lower than the placement, the lower-level course with its grade appears on the transcript but earns no credit toward graduation.

14. **Use of vertebrate animals** If the satisfactory completion of a course will require the use of vertebrate animals in experiments, the student must be notified of that requirement at the first meeting of the course. If a student objects on ethical grounds to participating in the animal usage in question, it is the student's responsibility to discuss the matter with the faculty member in charge and not to enroll in the course if no alternative acceptable to the faculty member can be arranged.

15. **Field trips** If the satisfactory completion of a course will require participation in a field trip, students should understand that there are inherent risks, including the risks of travel, involved in such an activity. If a student objects to assuming these risks, it is the student's responsibility to discuss the matter with the faculty member in charge and not to enroll in the course if no alternative acceptable to the faculty member can be arranged. Yale College's policies regarding field trips can be found at the Yale College Academic Field Trip Policies website.

16. **Fieldwork** If a student is conducting fieldwork away from the Yale campus, under the supervision of a faculty member, the student should discuss the inherent risks of such work and pre-departure guidelines with the supervising faculty member or director of undergraduate studies.

F. Withdrawal from Courses

Students are permitted to withdraw from courses for which they have enrolled in a term until 5 p.m. (ET) on the last day of classes before the reading period in that term. Withdrawal from a course can be accomplished only by the submission of a course change notice through the office of the residential college dean. A fee of $5 will be charged for the processing of an approved course change notice on which withdrawal from a course is requested. Formal withdrawal is important, because failure to receive credit for courses in which students are enrolled will be recorded as F on

their transcripts and may open them to the penalties described in section I, Academic Penalties and Restrictions, "Academic Warning" and "Dismissal for Academic Reasons."

1. **Transcripts** Each course listed on a student's course schedule appears on the student's transcript unless the student withdraws from the course by midterm. See paragraph 3, below.
2. **Permission** All course withdrawals require the permission of the residential college dean.
3. **Deadlines for withdrawal from courses** If a student formally withdraws from a full-term course by midterm, as published in the Yale College Calendar with Pertinent Deadlines, then after the registrar has recorded the withdrawal, the transcript will contain no indication of that course. If a student formally withdraws from a half-term course by the relevant deadline published in the Yale College Calendar with Pertinent Deadlines, then after the registrar has recorded the withdrawal, the transcript will contain no indication of that course.

   If a student formally withdraws from a full-term course after midterm but before 5 p.m. (ET) on the last day of classes before the reading period, the transcript will record the course and show the neutral designation W (Withdrew) for the course. If a student enrolled in a half-term course formally withdraws from it after the deadline for the course to be removed from the transcript, but by the last date a withdrawal is permitted from the course, the student's transcript will record the neutral designation W (Withdrew) for the course. See the Yale College Calendar with Pertinent Deadlines for both dates in each term. The deadlines apply to all courses, whether or not a particular course observes the reading period.

   A change of level in courses in which the subject is taught in an ordered progression, as, for example, in languages or in mathematics, is not considered a course withdrawal and does not result in the recording of a W (Withdrew).

   After these deadlines, withdrawal from a course is not permitted. An exception will be made only for a student who is approved for a medical leave of absence after the beginning of the reading period but by the last day of the final examination period; in such a case the student will be permitted to withdraw from a course with a mark of W (Withdrew).
4. **Withdrawal from a credit/year sequence** For those credit/year course sequences in which a student receives the mark of SAT or NSAT for the first term and a letter grade for the second, withdrawal from the sequence after the first term is completed but before the second term is completed will result in the recording of a mark of W (Withdrew) for the first term.
5. **Lack of formal withdrawal** If, when grades are due, the instructor of a course notifies the registrar that a student has not successfully completed a course from which the student has not formally withdrawn, then a grade of F will be recorded for that course on the student's transcript. See section B, Grades, "General Regulations Concerning Grades and Transcripts." See also section H, Completion of Course Work, "Work Incomplete at the End of Term" and "Postponement of Final Examinations."
6. **Withdrawal and Leave of Absence from Yale College** A student who is withdrawn or on leave of absence, including medical leave of absence, from Yale College may not attend classes or complete work that was assigned in the term in which the leave

or withdrawal occurred, even if the deadline for such assignments was previously extended by the instructor or by the residential college dean.

7. **Transcripts of students withdrawn from Yale College or approved for a medical leave of absence** If a student withdraws from Yale College by midterm, the transcript will not show that the student has been enrolled in any full time courses during that term. If a student withdraws from Yale College after midterm, but before 5 p.m. (ET) on the last day of classes before the reading period, the transcript will record the student's courses with the designation W (Withdrew). If a student withdraws from Yale College after the beginning of the reading period, the transcript will show the student's courses with grades of F unless an instructor reports a passing grade for the student in any of the courses. The only exception is for a student who is approved for a medical leave of absence after the beginning of the reading period but before the end of the term; see paragraph 3, above.

G. Reading Period and Final Examination Period

1. **Due dates for course work** It is expected that instructors will require all course assignments, other than term papers and term projects, to be submitted at the latest by the last day of reading period. Term papers and term projects are to be submitted at the latest by the last day of the final examination period. For the dates of the reading period and final examination period, consult the Yale College Calendar with Pertinent Deadlines. Instructors do not have the authority to give permission for these deadlines to be extended; only the residential college dean has this authority. See section H, Completion of Course Work, "Work Incomplete at the End of Term." Even if an extended deadline should be announced by the instructor, a grade reflecting work submitted after the end of the term cannot be accepted unless a Temporary Incomplete was authorized by the student's residential college dean.
2. **Reading period** The Yale College Faculty established the reading period between the end of classes and the beginning of final examinations in order to provide a period of about a week during which students might conclude their course work and prepare for final examinations. The instructor of each course determines whether or not that course observes the reading period. A course that does not observe the reading period is identified in the course listings by the abbreviation "RP" at the end of the course description or by a phrase such as "Meets RP" or "Meets during reading period."

   The assumption underlying the faculty's institution of the reading period was that no additional assignments would be required during the reading period in a course observing it, but that students would use the reading period in their own way to consolidate and augment the work of the course. Such being the case, no final examination may be administered during the reading period. A final examination in a course, whether or not the course observes the reading period, must be administered during the final examination period. No take-home final examination may be due during the reading period. An instructor may, however, set the due date for a term paper or project during the reading period.
3. **Final examinations** Yale College expects every course to conclude with a regular final examination or with a substitute for such an examination. The substitute should be in the nature of a final examination in that it requires the student to demonstrate proficiency in the discipline and subject matter of the course.

Substitutes may include, for example, an oral presentation or examination, a term essay, or the last of a series of tests administered during the last week of classes. Final examinations normally last either two or three hours but, in either case, students are permitted to take an additional half-hour before being required to turn in their answers. This additional time is given for improving what has already been written, rather than for breaking new ground.

4. **Scheduling of final examinations** The University Registrar's Office has assigned a specific time and date for the administration of final examinations in most courses in Yale College. The time of the final examination is determined by the meeting time of a course during the term. If the meeting time of a course is changed from that originally published, the time of the examination is defined by the new meeting time. If a course is published with no scheduled examination but the instructor subsequently decides to offer a final examination, it must be administered at the time defined by the meeting time of the course. The schedule of final examinations may be found in General Information under the heading Final Examination Schedules.
5. **Date of administering final examinations** Since the final examination schedule has been carefully designed to make efficient use of the entire final examination period and to minimize overcrowding of students' schedules, a final examination must be administered on the date and at the time specified. On occasion instructors have administered final examinations at times different from those assigned. Such an arrangement is allowed under the following conditions: (a) that two different and distinct final examinations be administered; (b) that one of these examinations be administered at the regularly specified time within the final examination period; (c) that the alternative examination be administered at a regular examination starting time during the final examination period; and (d) that no student be required to obtain permission to take the alternative examination.
6. **Take-home final examinations** Take-home final examinations are sometimes substituted for regular final examinations. If a course has been assigned a final examination date, a take-home examination for that course is due on the scheduled examination day. If a course has not been assigned a final examination date, a take-home examination for the course is due on the day specified in the final examination schedule by the meeting time of the course. See Final Examination Schedules. If a course does not meet at a time covered by the final examination schedule, a take-home examination may not be due during the first three days of the final examination period. No take-home examination may be due during the reading period.
7. **Due dates for term grades** An instructor is required to submit term grades promptly after the completion of a course. For due dates, consult the Yale College Calendar with Pertinent Deadlines.

   In submitting term grades, the instructor is expected to apply appropriate penalties for missed or incomplete work unless the late submission of the work has been authorized by the student's residential college dean or by the Committee on Honors and Academic Standing. If an instructor reports a mark of Incomplete for which there has been no authorization by the college dean, the Incomplete will be recorded by the University Registrar's Office as a grade of F.

8. **An end-of-term test instead of a final examination** Some instructors conclude their courses with a test that is the last in a succession of tests administered during the term. Such a test is meaningfully distinct in length to the standard two-and-one-half hour or three-and-one-half-hour examinations offered during the final examination period.

   For courses that observe the reading period and so do not have regular scheduled class meetings after the last day of classes, such a test may not be administered during the reading period, but may be administered only during the last week of classes or during the final examination period at the time specified in the final examination schedule.

   For courses that do not observe the reading period, this test may be administered during the reading period, since, in such courses, regular class meetings are scheduled to extend after the last class day and through the reading period. A course that does not observe the reading period may also administer the test during the final examination period at the time specified in the final examination schedule.

H. Completion of Coursework

SUBMISSION OF COURSEWORK TO INSTRUCTORS

Students in Yale College are expected to take personal responsibility for the timely delivery to their instructors of all coursework, including examinations, in the manner and format prescribed by the instructors. Students who submit coursework in a manner other than in person and directly to an appropriate individual should confirm as soon as possible after the submission that the work has been received. Students who submit work electronically should also confirm, before the work is due, that they are sending correct and readable files, and they should take appropriate measures (e.g., by copying themselves on any emailed submissions; taking computer screenshots; checking their submission status if using Canvas or Gradescope) to confirm that they submitted their work to the instructor on time.

LATE OR POSTPONED WORK

There are three kinds of late or postponed work: (1) work late during term time; (2) work incomplete at the end of term (i.e., the last day of Reading Period); and (3) postponed final examinations. When students know in advance that they must miss or postpone work for a legitimate reason, as described in "Work Missed During the Term" and in "Postponement of Final Examinations" below, they should inform the instructor and the residential college dean as soon as possible.

WORK MISSED DURING THE TERM

A student's residential college dean may give confidential permission for a student to make up work missed or delayed because of an incapacitating physical or mental health condition, the death of a family member, or a comparable emergency. The residential college dean also has authority to give permission to make up work missed in person because of the observance of religious holy days and because of participation in intercollegiate varsity athletic competition. This permission is conveyed by means of a special form which, upon approval by the college dean, is sent to the student's instructor. Students participating in events of intramural or club sports, as

differentiated from varsity events sponsored by the Department of Athletics, are not eligible for a postponement of work by the dean on account of those events.

In all other cases of work missed during the term, permission to make up coursework can only be secured directly from the instructor of the course. Instructors have full discretion and authority to grant or deny requests for extensions for work due during the term for any reason. This permission may not, however, extend beyond the last day of Reading Period, except for term papers and term projects. See "Work Incomplete at the End of Term" below.

WORK INCOMPLETE AT THE END OF TERM

Only the residential college dean has authority to give confidential permission to a student to submit work, other than term papers or term projects, in a course after the last day of Reading Period. The college dean may give such permission because of an incapacitating physical or mental health condition, the death of a family member, or a comparable emergency. In such cases, the college dean may authorize a mark of Temporary Incomplete for a period not to exceed one month from the beginning of the final examination period. Note that the mark of Temporary Incomplete refers to unfinished course work that was originally due in the closing weeks of the term, and not to assignments (such as lab reports, problem sets, reading responses, etc.) originally due prior to the closing weeks of the term. Note also that the mark of Temporary Incomplete does not refer to a final examination missed for any reason; see "Postponement of Final Examinations" below.

The residential college dean, in authorizing a mark of Temporary Incomplete, will stipulate the date on which the student's late work will be due and the date on which the instructor is expected to submit a course grade to the registrar. The college dean may not set this second date later than one month after the beginning of the final examination period. If the student's work has not been completed in time for the instructor to report a grade to the registrar by the deadline stipulated, then the instructor will submit a grade for the student that reflects the absence of the missing work, or the registrar will convert the mark of Temporary Incomplete to a grade of F. See section B, Grades, "General Regulations Concerning Grades and Transcripts," and section F, Withdrawal from Courses.

Permission for a mark of Temporary Incomplete to last beyond one month from the beginning of the final examination period can be granted only by the Yale College Committee on Honors and Academic Standing. Such an extension may be given only for a brief period of time, usually one to two weeks, and only in response to extraordinary circumstances, usually of a medical nature. A petition for such permission must be submitted at the earliest possible date. In considering such requests, the Committee on Honors and Academic Standing takes into account the original deadline for submission of the work and the date on which a petition is delivered to the committee.

USE OF COMPUTERS AND POSTPONEMENT OF WORK

Technological problems, such as computer failures or corrupt files, normally do not qualify for extensions or other accommodations. Students should exercise reasonable prudence to safeguard materials, including backing up data in multiple locations and at frequent intervals and making duplicate copies of work files. Any computer work

should be completed well in advance of the deadline in order to avoid last-minute technological problems. A student who experiences a computer-related problem while completing an assignment should immediately contact the course instructor for guidance.

POSTPONEMENT OF FINAL EXAMINATIONS

Only the residential college dean may authorize postponement of a final examination. The residential college dean may give such confidential permission because of an incapacitating physical or mental health condition, the death of a family member, or a comparable emergency. The residential college dean also has authority to give such permission because of the observance of religious holy days and because of participation in intercollegiate varsity athletic competition. Finally, the college dean may authorize postponement of a final examination if a student has three examinations scheduled during the first two full days of the final examination period, or three examinations scheduled consecutively in the final examination schedules.* The postponement of a final examination for any other reason requires the permission of the Committee on Honors and Academic Standing. A student's end-of-term travel plans are not a basis for the postponement of a final examination. See Final Examination Schedules and section G, Reading Period and Final Examination Period, paragraph 4.

* The final examination schedules indicate three examination sessions, or time slots, per day: one in the morning, one in the afternoon, and one in the evening. Some of these time slots contain examinations; others do not. A college dean may postpone an examination if a student has three examinations scheduled within any four consecutive time slots, whether or not each of those time slots has an examination assigned to it. See Final Examination Schedules. Occasionally an instructor may arrange an option for an alternative final examination in addition to the regularly scheduled examination. See section G, Reading Period and Final Examination Period, paragraph 5. Such an optional arrangement cannot be the basis for a postponement of an examination if three of a student's final examinations would thereby acquire "consecutive" status.

It is normally the expectation that when a student begins a final examination but does not complete it, the student will receive credit only for the work completed on the examination. If, however, a student becomes unable to complete an examination because of a sudden and serious illness or other emergency during the examination, the student may request authorization from the residential college dean to take a makeup final examination. In such a case, the student must explain their departure to the instructor, or to some other person proctoring the examination, before leaving the room, and must contact the residential college dean and Yale Health as appropriate as soon as possible thereafter.

Instructors generally administer makeup final exams. Makeup examinations for the fall term should be scheduled by the end of the second week of classes in the spring term. Makeup examinations for underclass students who miss final examinations in the spring term should be scheduled by the end of the second week of classes in the following fall term. Students who will not be enrolled at these times—whether because they are on leave of absence or on a Year or Term Abroad, or because they have withdrawn from Yale—must contact their residential dean's office in advance of the second week of classes about alternative arrangements. The registrar automatically records a grade of F in a course for a student who fails to take an officially scheduled

makeup examination in that course at the appointed time, unless the student is able to earn a passing grade without taking the final examination.

Permission to postpone a final examination does not authorize a student to submit other work late in that course. See "Work Incomplete at the End of Term," above.

I. Academic Penalties and Restrictions

CUT RESTRICTION

Regular classroom attendance is expected of all students. While Yale College enforces no general regulation concerning attendance, instructors of individual courses may require it of all students. This is particularly the case in discussion groups, seminars, laboratories, and courses in languages.

A student who, in the opinion of the instructor and of the residential college dean, has been absent from a course to an excessive degree and without excuse may at any time be placed on Cut Restriction in that course or in all courses. A student on Cut Restriction who continues to be absent from a course may, with the concurrence of the college dean and the Committee on Honors and Academic Standing, be excluded from it without credit. See "Exclusion from Courses" below.

EXCLUSION FROM COURSES

Any student may, because of excessive absences or unsatisfactory work, be excluded from a course without credit at any time upon the recommendation of the instructor or department concerned to the residential college dean and the Committee on Honors and Academic Standing. If the exclusion occurs after midterm and before the first day of the reading period, the student's record will show a mark of W for the course.

ACADEMIC WARNING

Academic Warning is an indication that a student's scholastic record is unsatisfactory. Students on Academic Warning who do not pass all of their courses in the term in which they are on Academic Warning will be dismissed for academic reasons. No matter how many course credits a student has earned, Academic Warning is automatic in the following cases: (a) failure in one term to earn more than two course credits; (b) a record that shows two grades of F in one term; (c) in two successive terms, a record that shows a grade of F for any course. The college deans attempt to give written notification of Academic Warning to students whose records show these deficiencies, but such students should regard themselves as being on warning even in the absence of written notification. A student permitted to continue in Yale College with fewer than the number of course credits ordinarily required for academic good standing may be placed on Academic Warning, and in such a case the student will be notified that they have been placed on warning. See section D, Promotion and Good Standing, "Requirements for Academic Good Standing." The Committee on Honors and Academic Standing may at its discretion disqualify a student on Academic Warning from participation in recognized University organizations.

DISMISSAL FOR ACADEMIC REASONS

1. **Failure in three classes** A record that shows three grades of F in a term or over two or three successive terms will normally result in the student's dismissal from

Yale College. "Successive terms" means successive terms in which the student enrolls, whether or not broken by a withdrawal or by a leave of absence. While Yale Summer Session grades are recorded on the Yale College transcript, they are not counted towards this total, because attendance at Yale Summer Session does not constitute a term of enrollment in Yale College.

2. **Failure to meet requirements for good standing or promotion** A student who has not, at the end of a term, met the minimum requirements for academic good standing, or a student who has failed to meet the minimum standards for promotion, may be dismissed unless permitted by the Committee on Honors and Academic Standing to repair the deficiency. See section D, Promotion and Good Standing, and "Makeup of Course Deficiencies for Promotion or Academic Good Standing" below. Any student, other than those enrolled though the Eli Whitney Students program, who drops below two course credits for any reason during the term will be withdrawn for academic reasons. A student who fails to earn any course credits in a term, or who is short by more than two credits of the minimum requirements for academic good standing or promotion, even if the student has no grades of F, will be dismissed.
3. **Students on Academic Warning** A record that shows a grade of F for a student who is on Academic Warning in that term will result in that student's dismissal for academic reasons. See "Academic Warning" above.
4. **Reinstated students** A student reinstated to Yale College after an academic withdrawal who does not, in the first or second term following reinstatement, pass all the courses completed in that term will be dismissed for academic reasons. See section J, Time Away and Return.
5. **Unsatisfactory academic record** In addition, at any point during the year a student may be dismissed from Yale College if in the judgment of the Yale College Committee on Honors and Academic Standing the student's academic record is unsatisfactory.

MAKE UP OF COURSE DEFICIENCIES FOR PROMOTION OR ACADEMIC GOOD STANDING

A student who has failed to satisfy the requirements for promotion or for academic good standing, if permitted to continue by the Committee on Honors and Academic Standing, must repair the deficiency promptly. Such deficiencies are to be repaired before the opening of the next fall term by work in summer school. The institution to be attended and the courses to be taken require the approval of the residential college dean. See section P, Credit from Other Universities. Only in extraordinary circumstances will a student be allowed to repair a deficiency by carrying an additional course during the following academic year. Course deficiencies may not be repaired under any circumstances by the application of acceleration credits.

J. Time Away and Return: Postponement, Leave of Absence, Medical Leave of Absence, and Withdrawal

POSTPONEMENT

1. **Newly admitted students** Students may ask to postpone their matriculation by one year. One-term postponements are not permitted, as new students must begin in a fall term. Requests for postponements are ordinarily approved. For more details, see Important Information for Students Considering Postponed Matriculation on the Undergraduate Admissions website.
2. **Petition for postponement** Admitted students who wish to postpone matriculation should make their request to the Yale Office of Undergraduate Admissions office by May 1; they will be asked to provide a brief statement about their plans for the year of postponement. Late requests will be reviewed up until the fifteenth day of the fall term.
3. **Finances** Depending on the timing of the postponement request, there may be financial consequences, including a substantial housing relinquishment fee. See "Rebates of Undergraduate Charges" under "Financial Services" in the Yale College Undergraduate Regulations. Students receiving financial aid should contact the Office of Undergraduate Financial Aid prior to requesting a postponement. The office will help answer questions students may have regarding if and how their postponement might affect financial aid and help identify any impacts to their financial obligations (including student loan information).
4. **Campus access** Students who postpone will be considered guests or visitors on Yale's campus and must follow all relevant university policies regarding guests and visitors. Students living in on-campus housing at the time of taking a postponement are expected to move out within a few days, usually within 72 hours. If invited to stay on campus by other students, they must abide by the three-day limit on guests. See "Guests" under "Conduct in the Dormitories" in the Yale College Undergraduate Regulations.
5. **Email access** Students who postpone after activating their Yale College email accounts will ordinarily retain access during their postponement year.
6. **Residential college affiliation** Students who postpone after the assignment of a residential college will ordinarily retain that affiliation when they return.
7. **Parental notification** Yale College assumes that students who postpone matriculation will inform their parents or guardians that they intend to do so. Ordinarily, the Admissions Office does not notify parents or guardians that a student has postponed but may do so if they believe that such notification is appropriate.
8. **Activity while on leave** Students who postpone matriculation are expected to be constructively occupied and to maintain a satisfactory standard of conduct during their postponement year. Note that they may not enroll full-time in a degree-granting program at another institution. Students who choose to pursue part-time studies at other institutions should bear in mind that any credits earned will not necessarily count towards their Yale degree.

9. **Matriculation after postponement** Students who postpone will automatically be included in the following year's admitted class.

LEAVE OF ABSENCE

Students in Yale College may ask to take up to four terms of leaves of absence. Requests for leaves of absence are ordinarily approved, provided that the student departs in academic good standing at the end of a term and returns at the beginning of a term. See "Requirements for Academic Good Standing" in "Section D, Promotion and Good Standing" in the Yale College Academic Regulations.

1. **Petition for a leave of absence** Students who wish to take a leave of absence must petition the Committee on Honors and Academic Standing through their residential college dean. For a fall term leave of absence, students must submit a petition by May 1; late requests will be accepted up to 5:00 p.m. (EST) on the fifteenth day of the fall term. For a spring term leave of absence, petitions must be received by 5:00 p.m. (EST) on the fifteenth day of the spring term. The form to request a leave of absence is available at https://forms.sis.yale.edu/url/YCLeaveofAbsence.

2. **Activity while on a leave** Many students engage in focused activities while on leave (e.g., part-time coursework, volunteering, employment, and so on) but this is not required.

3. **Finances** Depending on the timing of the leave of absence request, there may be financial consequences, including a substantial housing relinquishment fee. See "Rebates of Undergraduate Charges" under "Financial Services" in the Yale College Undergraduate Regulations. Students receiving financial aid should contact the Office of Undergraduate Financial Aid prior to requesting a leave. The office will help answer questions students may have regarding if and how their leave might affect financial aid and help identify any impacts to their financial obligations (including student loan information). Students taking a leave of absence who have received long-term loans will be sent information about loan repayment obligations, which in most cases begin six months after the last day of formal enrollment at Yale.

4. **Total terms of leave** Students are eligible for a total of four terms of leave of absence. These terms need not be taken consecutively. (Note that, as a COVID-19 accommodation, leaves taken during academic years 2020–21 and 2021–22 do not count against the total terms of leave. Medical leaves of absence also do not count against this total.) Students who do not return from leave after a fourth term will be withdrawn for administrative reasons.

5. **Accelerated students** Students taking an accelerated degree by use of acceleration credits who have had four terms of leave of absence may receive a fifth term of leave if the fifth term of leave is needed to bring the student's pattern of attendance into conformity with the pattern of attendance stipulated for an accelerated degree. See "Enrollment requirements, including required patterns of attendance" in "Acceleration Policies" in the Yale College Academic Regulations.

6. **Campus access** Students on leave may be present on Yale's campus as guests or visitors and must follow all relevant university policies as such. Students living in

on-campus housing at the time of taking leave are expected to move out within a few days, usually within 72 hours. If invited as a guest in the dorms by other students, they must abide by the three-day limit. See "Guests" under "Conduct in the Dormitories" in the Yale College Undergraduate Regulations. Students on leave may usually participate in undergraduate activities and registered student organizations as a guest but may not hold leadership positions or participate in university sponsored or funded international travel.

7. **Email and library access** Students on leave retain remote library privileges and email access.
8. **Campus employment** Students on leave may hold student employment jobs; they may also work at Yale in other employment categories.
9. **Disciplinary violations** A leave of absence does not preclude students from being charged with disciplinary violations of the Undergraduate Regulations in relevant circumstances.
10. **Parental notification** Yale College assumes that students who take leaves of absence will inform their parents or guardians that they intend to do so. Ordinarily, residential college deans do not notify parents or guardians that a student has taken a leave of absence but may do so if they believe that such notification is appropriate.
11. **Health coverage** Students on a leave of absence are eligible to enroll in the Yale Health Affiliate Coverage for Students for up to two terms following their leave. This enrollment is not automatic. Students are responsible for completing and submitting the appropriate enrollment forms and full payment to Yale Health Member Services by September 15 for the full year or fall term, and by January 31 for the spring term. See "Leave of Absence" under "Health Services" in the Yale College Undergraduate Regulations. Application forms and details about medical coverage while on a leave of absence may be obtained from the Member Services Department of Yale Health.
12. **Canceling a leave of absence** Students may cancel a leave of absence for either term as late as 5:00 p.m. (EST) on the first day of classes in the term for which the leave has been requested. The form to cancel a leave of absence is available at https://forms.sis.yale.edu/url/YCCancelLOA. (Given this deadline, students who request a leave during the first fifteen days of the term may not subsequently cancel that request.) The deadlines for payment of the term bill and the penalties for late payment apply. See "Payment of Fees" under "Financial Services" in the Yale CollegeUndergraduate Regulations.

RETURNING FROM A LEAVE OF ABSENCE

1. Students on a leave of absence are automatically reinstated. They ordinarily return from a leave of absence at the beginning of the term specified in their leave petition to the Committee on Honors and Academic Standing, but they may extend their leave by additional terms if they wish, up to the total terms of eligible leave as described above. Returns must always be at the start of term.
2. To return from leave, students must notify their residential college dean no later than the first day of the term in which they wish to return.

3. Students who are required to live on campus, or who wish to do so, must be in contact with Undergraduate Housing well in advance of their return from leave to make those arrangements.
4. Note: A student on a leave of absence from Yale College with pending disciplinary charges will not be eligible to return to Yale College or to receive a Yale College degree until the student's case has been adjudicated by the Yale College Executive Committee or the University-Wide Committee on Sexual Misconduct.

MEDICAL LEAVE OF ABSENCE

Yale College is committed to supporting the health and well-being of all members of its campus community. Yale recognizes that students may experience medical situations that significantly limit their ability to function successfully and safely in their role as students. A medical leave of absence permits students to take a break from Yale and their studies at any point in a term, regardless of their academic standing, so that they may address medical concerns and later return to Yale to pursue their educational goals. When they wish to return, students on medical leaves of absence participate in a medical clearance process as described below. The Associate Dean of Residential College Life (time.away@yale.edu) in the Office of Student Affairs is available as a non-evaluative, informational, year-round resource to students considering a medical leave of absence and those on a medical leave of absence. Students may also find it helpful to consult with Student Accessibility Services.

1. **Petition for a medical leave of absence** Students who wish to take a medical leave of absence should consult with their residential college dean, who will guide them through the process. Students are also welcome to consult with the Associate Dean of Residential College Life (time.away@yale.edu) in the Office of Student Affairs. Students may wish to discuss the full range of options, including potential accommodations that might allow them to remain enrolled, with their residential college dean; a consultation with Student Accessibility Services may also be helpful. Students who wish to pursue a medical leave of absence should also discuss the process for returning to their studies with their dean. The form to initiate a medical leave of absence is available at https://forms.sis.yale.edu/url/YCMLOA.

    a. To request a medical leave of absence, students meet with a Yale Health clinician—the Chief of Student Health, the Chief of Mental Health and Counseling, or one of their official designees—who will conduct an individual assessment to determine if a medical leave of absence is appropriate. Students under the care of a non–Yale Health clinician may ask their external clinician to submit medical documentation in order to inform the assessment of the Yale Health clinician. To arrange the meeting, students should email either studenthealth.chief@yale.edu or mhc.chief@yale.edu.

    b. If the Yale Health clinician determines that a medical leave of absence is appropriate, they will do so in writing, including the basis for the decision, a recommended length of leave, and any conditions the student must satisfy before a return, including, but not limited to, completing the medical clearance process for return. The Chief of Student Health, the Chief of Mental Health and

Counseling, or one of their official designees will generally provide the student with a recommended duration of leave, which will ordinarily be based primarily on the student's (or their representative's) request and any assessment from the student's treating provider, unless there is a reasonable basis to look beyond that request and/or assessment.

c. With the support of the Yale Health clinician, the student may submit a medical leave of absence request to the residential college dean. The dean will forward this request to the Committee on Honors and Academic Standing (CHAS) for approval, which will ordinarily be granted. A student may revoke a leave by contacting their residential college dean in writing within three (3) days of CHAS's approval. This revocation period may not be waived.

d. In the unlikely event that a request for a medical leave of absence is not granted, the student will have seven (7) days from the date of notification to appeal the decision in writing to the Dean of Yale College. The appeal should include the student's reasons for wanting a medical leave of absence, along with any supporting clinical documentation that the student wishes to be considered.

e. Students on other forms of time away (leaves and withdrawals) may also petition for a medical leave of absence, even if their time away has already begun.

2. **Involuntary medical leave of absence** In rare circumstances the Dean of Students may require a student to take a medical leave of absence. This action would only be taken after an individualized assessment concludes that (i) there is a significant risk to the student's health or safety or to the health or safety of others, or the student's behavior severely disrupts the University environment, and (ii) that no reasonable accommodations can adequately reduce that risk or disruption. This standard is not met solely because a student has a particular diagnosis or is receiving a particular treatment.

   a. The Chief of Student Health or the Chief of Mental Health and Counseling will conduct the individualized assessment. That assessment will include, where possible, input from the student or the student's treating provider. The Chief of Student Health or the Chief of Mental Health and Counseling will strongly consider input from the student's treating provider unless there is a reasonable basis to discount it. If the Chief of Student Health or the Chief of Mental Health and Counseling conclude that a student should be placed on an involuntary medical leave of absence, they will make that recommendation to the Dean of Students, including an explanation and a recommendation for the length of the leave. A student may also be placed on an involuntary medical leave of absence if they refuse to cooperate with efforts deemed necessary by Yale Health and the Dean of Students to make the assessment discussed above.

   b. The Dean of Students will review the relevant information and determine if an involuntary leave of absence is necessary. The circumstances of each student's situation are assessed individually, with attention to the possibility that reasonable accommodations would permit the student to continue to participate in Yale's academic and residential community.

   c. The Dean of Students' decision to place a student on an involuntary medical leave of absence will be in writing and will include the

basis for the decision, a timeline for student's departure from campus, a recommended length of leave, and any conditions the student must satisfy before a return, including but not limited to completing the medical clearance process. It will also include information about the appeal process. The Dean of Students will ordinarily not impose reinstatement conditions unrelated to the circumstances that led to the leave, but may do so when a student is withdrawn for academic and/or disciplinary reasons or when a student is away for more than four terms.

   d. A student who is required to take a medical leave of absence will have seven (7) days from the date of notification to appeal the decision in writing to the Dean of Yale College. During the appeal process, they are expected to comply with the leave of absence requirements.

3. **Considering options while in in-patient treatment settings** In a medically appropriate time and manner, students in these settings will be provided options for next steps, including but not limited to returning to campus, seeking accommodations, and/or requesting a medical leave of absence. Yale College administrators are available to answer questions about any of these options.
4. **Coursework in process** Students on medical leaves of absence may not attend classes or submit additional coursework as of the date of their leave. Ordinarily, they are withdrawn from any courses in process. See "Withdrawal and Leave of Absence from Yale College" under "Withdrawal from Courses" in the Yale College Academic Regulations. In some cases, when students have already completed all or most of the coursework for a given class, they may receive a passing grade based on the work already completed. See "Work Incomplete at the End of Term" under "Completion of Coursework" in the Yale College Academic Regulations.
5. **Representative** Students may designate an advisor to assist them in explaining the process and help the student make decisions in any part of the medical leave and appeals process. But an advisor may not act in lieu of the student unless required by law.
6. **Duration of medical leaves of absence** The recommendation for the length of the leave will be individualized and based on a clinical assessment. Students may remain on a medical leave of absence for as long as they wish. Students may also request to return early, before the recommended date, or choose to extend their leave beyond the initial recommendation. Yale students typically remain away for at least one full term, not including the term in which the leave occurred, before returning to Yale College, but this length will vary based on individual circumstances. The medical leave is intended to allow students to achieve the level of sustained stability needed to support a successful return, and students are encouraged to take the time they need.
   a. Note: When new students take medical leave without completing their initial fall term, they will remain in the new student category. When they return, they must do so in a fall term and participate in all new student activities, including the Camp Yale orientation programs. They are not eligible for spring term reinstatement.
   b. Note: *Coursework Requirement for Students Away for More than Four Terms* Following an extended absence of any kind, students are required to prepare

for their return by completing two term courses or their equivalent, either in Yale Summer Session or at another accredited four-year Bachelor's degree-granting college or university, and to receive grades of A or B. These courses must be completed and graded before the start of the term in which the student plans to return, and no more than two years before that date. Students should email the Committee on Reinstatement (reinstatement@yale.edu) with the details of the courses they plan to take, including the institution, in order to verify that the courses will meet the requirements. Students facing availability issues and/or financial hardship may petition to take courses at a community college. Students on financial aid who are required to complete coursework will have their Student Share waived for the year in which they are reinstated.

7. **Activity while on leave** Students on medical leaves of absence are expected to receive appropriate medical treatment for the condition(s) that resulted in the leave. Many students also find it helpful to engage, when possible, in other focused activities—e.g., part-time coursework, volunteering, employment, and so on—but this is not required in most situations. Students are encouraged to prioritize medical treatment.
8. **Finances** The financial consequences of the medical leave of absence will depend on the timing, and on whether the student purchased tuition insurance. See "Rebates of Undergraduate Charges" under "Financial Services" in the Yale College Undergraduate Regulations. Students receiving financial aid should contact the Office of Undergraduate Financial Aid prior to requesting a leave. The office will help answer questions students may have regarding if and how their leave might affect financial aid and help identify any impacts to their financial obligations (including student loan information). Students taking a medical leave of absence who have received long-term loans will be sent information about loan repayment obligations, which in most cases begin six months after the last day of formal enrollment at Yale.
9. **Campus access** Except as set forth in ¶ 15 below (Yale Summer Session Classes), students on medical leave may be present on Yale's campus as guests or visitors and must follow all relevant university policies. Students living in on-campus housing at the time of a medical leave of absence are expected to move out within a few days, usually within 72 hours. Special considerations regarding moving out may arise when students are in in-patient treatment settings. Yale evaluates any such considerations on a case-by-case basis. If invited as a guest in the dorms by other students, they must abide by the three-day limit. See "Guests" under "Conduct in the Dormitories" in the Yale College Undergraduate Regulations. Students on leave may usually participate in undergraduate activities and registered student organizations as a guest but may not hold leadership positions or participate in university sponsored or funded international travel.
10. **Email, library, and other access** Students on leave ordinarily retain email access for three years from the date of their leave. Students will generally also have access to certain other services, such as the Office of Career Strategy and remote library access, if reasonably possible.
11. **Campus employment** Students on leave may hold student employment jobs; they may also work at Yale in other employment categories.

12. **Disciplinary violations** A leave of absence does not preclude students from being charged with disciplinary violations of the Undergraduate Regulations in relevant circumstances.
13. **Parental notification** Residential college deans ordinarily notify parents or guardians when a student goes on a medical leave of absence. See Parental Notification for full details.
14. **Health coverage** Students going onto a medical leave of absence who are already enrolled in the Yale Health Hospitalization & Specialty Coverage have the option to enroll in the Yale Health Affiliate Coverage for Students for one year. This enrollment is not automatic. The Time Away Resource will offer assistance. Students are responsible for completing and submitting the appropriate enrollment forms and full payment to Member Services within 30 days of going on leave. Some financial support may be available for students whose YHH/SC plan was covered by their financial aid. Application forms and details about medical coverage while on a medical leave of absence may be obtained from the Member Services Department of Yale Health.
15. **Yale Summer Session classes** Students on a medical leave of absence are eligible to enroll in Yale Summer Session. Students on a medical leave of absence are eligible to apply for Yale Study Abroad summer opportunities. See Yale Study Abroad for full details.
16. **Denial of access** Notwithstanding any of the foregoing, Yale College may restrict a student's access to campus, classes, and/or services if it determines that (i) there is a significant risk to the student's health or safety or to the health or safety of others, or the student's behavior severely disrupts the University environment, and (ii) that no reasonable accommodations can adequately reduce that risk or disruption.

RETURNING FROM A MEDICAL LEAVE OF ABSENCE

Medical leaves are intended to give students time to receive treatment and focus on their health and wellbeing. The medical clearance process by which students return is intended to allow students to demonstrate that they will be able to adequately monitor their own health and function effectively in the autonomous student environment at Yale, without risk to their health or significant disruptions to others in the campus community. The goal is for students to be able to return to campus and be successful in their academic, co-curricular, and extra-curricular pursuits. The medical clearance process will therefore usually be limited to a determination regarding whether the conditions that led to the leave have been sufficiently addressed for the student to return with or without reasonable accommodations based on an individualized assessment.

1. **Timing of return** Students wishing to return from medical leave may request to do so when they feel ready. This may be in keeping with the timeline recommended when they went on leave but need not be and Yale will not approve or deny requests solely based on the recommended duration of the leave. There is no limit to the number of terms a student may be on medical leave.
    a. Returns must be at the start of a fall or spring term. New students who have not yet completed an initial term may only return at the start of a fall term,

and must participate in all new student activities, including the Camp Yale orientation programs.

b. Note: Enrollment in Yale Summer Session does not require reinstatement. Yale Study Abroad summer opportunities do require medical clearance. See Yale Study Abroad for full details.

c. Note: A student on medical leave from Yale College with pending disciplinary charges will not be eligible to return to Yale College or to receive a Yale College degree until the student's case has been adjudicated by the Yale College Executive Committee or the University-Wide Committee on Sexual Misconduct.

2. **Deadlines for requesting reinstatement** To return for a fall term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on June 1. To return for a spring term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on November 1. Students who are unable to submit a complete request by the deadline may write to reinstatement@yale.edu, explaining the cause of the delay and asking for an extension. Extensions beyond December 15 or July 15 will only be granted in exceptional circumstances; Yale College cannot guarantee that it will be able to render a decision on requests after those dates.
3. **Materials to be submitted**
   a. Online *Reinstatement Request* form. Email reinstatement@yale.edu to request form.
   b. Brief statement (approximately 500-750 words) describing the circumstances that led to the medical leave, the treatment received while on leave and any other activities the student deems relevant, and the student's own sense of their readiness to return to Yale College.
   c. Name and contact information for the clinician who will be submitting a medical letter.
   d. *For students who have been away for more than four terms* Verification that the student has completed two term courses or their equivalent, either in Yale Summer Session or at another accredited, four-year, Bachelor's degree-granting college or university, with grades of A or B. Courses may be in process at the time of the request but must be completed and the grades received before the start of the term in which the student wishes to return. (See details above.)
4. **Medical letter** This should be sent directly from the clinician to the appropriate chief in Yale Health, either the Chief of Student Medicine or the Chief of Mental Health and Counseling. That letter ordinarily should include:
   a. The clinician's credentials and clinical setting;
   b. The nature of their work with the student, including the duration and frequency of their contact;
   c. Any observed progress in the student's recovery from the medical condition that led to the leave of absence;
   d. The clinician's assessment of the student's clinical status and their readiness to successfully resume academic and university life;
   e. The justification for their assessment of the student's readiness.

5. **Meeting** Once the materials, including the medical letter, have been received, a meeting will be scheduled with the Chief of Student Health, the Chief of Mental Health and Counseling, or their official designee. The meeting will ordinarily involve a discussion about the circumstances that led to the leave, the student's readiness to return, and accommodations and resources that may be available to the student upon their return. The Chief of Student Health or the Chief of Mental Health and Counseling, or their official designee, will then provide a recommendation to the Committee on Reinstatement as to whether the student is ready to successfully resume academic and university life.
6. **Individual assessment of request** The Committee on Reinstatement will review all the information provided and will strongly consider the opinion of the student's treating provider unless there is a reasonable basis to discount it. The Committee on Reinstatement will then make an individualized determination as to whether the student has met the criteria to be cleared for return, and notify the student accordingly.
    a. When the Committee on Reinstatement clears a student for return, they will assess the number of remaining course credits and allocate additional terms of enrollment (beyond the standard eight terms) as necessary. Reinstated students are not required to take these additional terms but are encouraged to do so in order to avoid taking an academic overload. Students are eligible to apply for financial aid for any additional terms.
    b. If a student is not cleared for return, the Committee will provide a written explanation to help the student understand the reasons behind their decision and will recommend steps the student might take to be more successful in future requests. It is rare for a student to need to make multiple requests, but there is no limit to the number of times a student may request a return.
7. **Appeals process** The vast majority of students are cleared to return on their initial request. Students who are cleared to return are generally expected to meet the same academic and overall standards as other students unless the student is simultaneously on an academic withdrawal. Students who are not cleared to return may appeal the decision. The appeal must be made in writing to the Dean of Yale College no later than ten (10) days from the date on which the student is notified of the decision.
8. **Returning from a medical leave of absence** Students returning from a medical leave of absence who fail to enroll in the term for which they were reinstated, or who cease to be enrolled on or before the fifteenth day of the term, will be placed back on medical leave of absence.

PUBLICATION OF DATA

Yale publishes the number of students who take medical leaves of absence each term, the number of requests for reinstatement from such leaves each term, and the number of such requests that are granted or denied each term. See Statistics on Students Taking, and Returning From, Medical Leave of Absence for full details.

WITHDRAWAL

There are five types of withdrawal: academic, disciplinary, financial, personal, and administrative.

ACADEMIC WITHDRAWAL

Students may be withdrawn for academic reasons on a variety of grounds. See "Dismissal for Academic Reasons" in "Section I, Academic Penalties and Restrictions" in the Yale College Academic Regulations.

1. **Duration of academic withdrawals** Students who are withdrawn for academic reasons must remain away for at least one fall term and one spring term, in either order, not including the term in which the withdrawal occurred. They may choose to stay away longer. They may also choose to apply for early reinstatement, which may be granted in rare circumstances.

    a. *Note: Coursework Requirement for Students Away for More than Four Terms* Following an extended absence of any kind, students are required to prepare for their return by completing two term courses or their equivalent, either in Yale Summer Session or at another accredited, four-year, Bachelor's degree-granting college or university, and to receive grades of A or B. These courses must be completed and graded before the start of the term in which the student plans to return, and no more than two years before that date. Students should email the Committee on Reinstatement (reinstatement@yale.edu) with the details of the courses they plan to take, including the institution, in order to verify that the courses will meet the requirements. Students facing availability issues and/or financial hardship may petition to take courses at a community college. Students on financial aid who are required to complete coursework will have their Student Share waived for the year in which they are reinstated.

2. **Campus access** Students on academic withdrawal may be present on Yale's campus as guests or visitors and must follow all relevant university regulations as such. Students living in on-campus housing will have a few days (usually 72 hours) to vacate their room after withdrawing. If invited to campus by other students, students on withdrawal must abide by the three-day limit on guests, as stipulated in the Yale College Housing Regulations. Students on academic withdrawal may usually participate in undergraduate activities and registered student organizations as guests but may not hold leadership positions or participate in university sponsored or funded international travel.
3. **Email and remote library access** Academically withdrawn students usually will retain email access for three years from the term of withdrawal. Remote library access is periodically reset to include only active students, dropping students who are withdrawn.
4. **Campus employment** Students on academic withdrawal may not hold student employment jobs but may work at Yale in other employment categories.
5. **Yale Summer Session classes** Students on an academic withdrawal are eligible to enroll in Yale Summer Session.
6. **Finances** The financial consequences will depend on the timing of the withdrawal. See "Rebates of Undergraduate Charges" under "Financial Services" in the Yale College Undergraduate Regulations. Students receiving financial aid should contact the Office of Undergraduate Financial Aid. The office will help answer questions students may have regarding if and how their withdrawal might affect financial aid

and help identify any impacts to their financial obligations (including student loan information). Students who have received long-term loans will be sent information about loan repayment obligations, which in most cases begin six months after the last day of formal enrollment at Yale.

7. **Disciplinary violations** A withdrawal does not preclude students from being charged with disciplinary violations of the Undergraduate Regulations in relevant circumstances.
8. **Parental notification** Due to the change in enrollment status, residential college deans ordinarily notify parents or guardians when a student is withdrawn.
9. **Health coverage** Students on withdrawal are not eligible for medical coverage or treatment through Yale Health.

RETURNING FROM AN ACADEMIC WITHDRAWAL

An academic withdrawal provides students with the opportunity both to address whatever circumstances prevented them from meeting their academic obligations and to repair certain academic deficiencies. The reinstatement process allows students to demonstrate that they are prepared to return to academic, co-curricular, and extra-curricular pursuits. *Note that students may be reinstated only once after an academic withdrawal; subsequent academic withdrawals are permanent.*

1. **Timing of return** Students wishing to return from an academic withdrawal may request to be reinstated when they feel prepared to reengage with their academic obligations. Students who are withdrawn for academic reasons are normally away for two full terms of enrollment. Requests to return early will be considered but are granted only in exceptional circumstances. There is no time limit on how long a student may remain withdrawn.

    a. Returns must be at the start of a fall or spring term. (Enrollment in Yale Summer Session does not require reinstatement.)

    b. Note: A student withdrawn from Yale College with pending disciplinary charges will not be eligible to return to Yale College or to receive a Yale College degree until the student's case has been adjudicated by the Yale College Executive Committee or the University-Wide Committee on Sexual Misconduct.

2. **Deadlines for requesting reinstatement** To return for a fall term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on June 1. To return for a spring term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on November 1. These deadlines are#strictly enforced. Students who are unable to submit a complete request by the deadline may write to reinstatement@yale.edu, explaining the cause of the delay and asking for an extension, recognizing that extensions will only be granted in exceptional circumstances.
3. **Materials to be submitted**
    a. Online Reinstatement Request form. Email reinstatement@yale.edu to request form.

   b. A brief statement (approximately 500-750 words) describing the circumstances that led to the academic withdrawal, the activities pursued while away, and the student's own sense of their readiness to return to Yale College.
   c. For students who have been away for more than four terms: Verification that the student has completed two term courses or their equivalent, either in Yale Summer Session or at another accredited, four-year, Bachelor's degree-granting college or university, with grades of A or B. Courses may be in process at the time of the request but must be completed and the grades received before the start of the term in which the student wishes to return. (See details above.)

4. **Individual assessment of request** The Committee on Reinstatement will review all the information provided, make an individualized determination as to whether the student has met the criteria to be cleared for return, and notify the student.
   a. When the Committee on Reinstatement clears a student for return, they will assess the number of remaining course credits and allocate additional terms of enrollment as necessary. Reinstated students are not required to take these additional terms but are encouraged to do so in order to avoid taking an academic overload. Students are eligible to apply for financial aid for these additional terms.
   b. If a student is not cleared for return, a written explanation will be provided to help the student understand the reasons behind the Committee's decision and recommended steps they might take to be more successful in future requests.
5. **Appeals process** Most students are cleared to return. If a student is not cleared, they may appeal the decision. The appeal must be made in writing to the Dean of Yale College no later than seven days from the date on which the student is notified of the decision. A student can also request reinstatement again in future terms.
6. **Academic requirements following reinstatement** Students who are reinstated from an academic withdrawal must pass all of their courses in their first two semesters back. They may withdraw from courses in progress (see "Withdrawal from Courses" in the Yale College Academic Regulations) but they may not fail any courses in which they remain enrolled.
7. **Returning from an academic withdrawal** Students returning from an academic withdrawal who fail to enroll in the term for which they were reinstated, or who cease to be enrolled on or before the fifteenth day of the term, will be placed back on academic withdrawal.

DISCIPLINARY WITHDRAWAL (SUSPENSION)

Students who are found to have violated the undergraduate regulations or other university policies may be withdrawn by the Yale College Executive Committee or the University-Wide Committee on Sexual Misconduct. See the Yale College Undergraduate Regulations.

Under limited circumstances, students may also be withdrawn by the Dean of Yale College or their delegate. See "Emergency and Administrative Suspensions" in the Yale College Undergraduate Regulations. These suspensions are usually followed by a disciplinary hearing but can be lifted earlier by action of the dean or a delegate of the dean, or by the disciplinary committee after a preliminary review.

1. **Duration of disciplinary withdrawal** The length of a disciplinary withdrawal is set by the disciplinary committee. Students may choose to stay away longer.

    a. *Note: Coursework Requirement for Students Away for More than Four Terms* Following an extended absence of any kind, students are required to prepare for their return by completing two term courses or their equivalent, either in Yale Summer Session (if the term of suspension is complete) or at another accredited, four-year, Bachelor's degree-granting college or university, and to receive grades of A or B. These courses must be completed and graded before the start of the term in which the student plans to return, and no more than two years before that date. Students should email the Committee on Reinstatement (reinstatement@yale.edu) with the details of the courses they plan to take, including the institution, in order to verify that the courses will meet the requirements. Students facing availability issues and/or financial hardship may petition to take courses at a community college. Students on financial aid who are required to complete coursework will have their Student Share waived for the year in which they are reinstated.

2. **Coursework in process** Withdrawn students may not attend classes or submit additional coursework as of the date of withdrawal. Ordinarily, they are withdrawn from any courses in process. See "Withdrawal and Leave of Absence from Yale College" under "Withdrawal from Courses" in the Yale College Academic Regulations. In some cases, when students have already completed all or most of the coursework for a given class, they may receive a grade based on the work already completed. See "Work Incomplete at the End of Term" under "Completion of Coursework" in the Yale College Academic Regulations. If grades are not already submitted, it will be up to the student to determine if they wish to accept the grade for work completed.
3. **Campus access** Students withdrawn for disciplinary reasons are prohibited from being on campus without the advance written permission of their residential college dean, or the dean of students. They may not participate in undergraduate activities or registered student organizations.
4. **Email and remote library access** Students withdrawn for disciplinary reasons lose access to their email and to library services.
5. **Campus employment** Students on disciplinary withdrawal may not hold student employment jobs but may work remotely for Yale in other employment categories.
6. **Yale Summer Session classes** Students on a disciplinary withdrawal may not enroll in YSS classes.
7. **Finances** The financial consequences will depend on the timing of the withdrawal. See "Rebates of Undergraduate Charges" under "Financial Services" in the Yale College Undergraduate Regulations. Students receiving financial aid should contact the Office of Undergraduate Financial Aid. The office will help answer questions students may have regarding if and how their withdrawal might affect financial aid and help identify any impacts to their financial obligations (including student loan information). Students who have received long-term loans will be sent information about loan repayment obligations, which in most cases begin six months after the last day of formal enrollment at Yale.

8. **Disciplinary violations** A disciplinary withdrawal does not preclude students from being charged with additional disciplinary violations of the Undergraduate Regulations in relevant circumstances.
9. **Parental notification** Due to the change in enrollment status, residential college deans ordinarily notify parents or guardians when a student is disciplinarily withdrawn.
10. **Health coverage** Students on withdrawal are not eligible for medical coverage or treatment through Yale Health.

RETURNING FROM A DISCIPLINARY WITHDRAWAL

Students who wish to return from a disciplinary withdrawal must fulfill any requirements set by the disciplinary board.

1. **Timing of return** Students wishing to return from a disciplinary withdrawal may request to do so when they feel ready, once the period of the required withdrawal has passed. Requests to return early will not be considered. There is no time limit on how long a student may remain withdrawn.
    a. Returns must be at the start of a fall or spring term.
    b. Note: A student with additional pending disciplinary charges will not be eligible for Yale College reinstatement, re-enrollment, or a Yale College degree until the student's case has been adjudicated by the Yale College Executive Committee or the University-Wide Committee on Sexual Misconduct.
2. **Reinstatement requirement** The disciplinary board may or may not require participation in the reinstatement process.
    a. If the disciplinary board has not required a student to go through the reinstatement process, the student may return by notifying their residential college dean no later than the first day of the term in which they wish to return.
    b. Students who are required to live on campus, or who wish to do so, must be in contact with their dean well in advance to make those arrangements. Students who are required to go through the reinstatement process should follow the instructions below.
3. **Deadlines for requesting reinstatement** To return for a fall term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on June 1. To return for a spring term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on November 1. These deadlines are#strictly enforced. Students who are unable to submit a complete request by the deadline may write to reinstatement@yale.edu, explaining the cause of the delay and asking for an extension, recognizing that extensions will only be granted in exceptional circumstances.
4. **Materials to be submitted**
    a. Online Reinstatement Request form. Email reinstatement@yale.edu to request form.
    b. Brief statement (approximately 500-750 words) describing the circumstances that led to the disciplinary withdrawal, the activities pursued while away, and the student's own sense of their readiness to return to Yale College.

   c. For students who have been away for more than four terms: Verification that the student has completed two term courses or their equivalent, either in Yale Summer Session or at another accredited, four-year, Bachelor's degree-granting college or university, with grades of A or B. Courses may be in process at the time of the request but must be completed and the grades received before the start of the term in which the student wishes to return. (See details above.)
   d. Documentation of having met any additional requirements imposed by the disciplinary board.

5. **Individual assessment of request** The Committee on Reinstatement will review all the information provided, make an individualized determination as to whether the student has met the criteria to be cleared for return, and notify the student.
   a. When the Committee on Reinstatement clears a student for return, they will assess the number of remaining course credits and allocate additional terms of enrollment as necessary. Reinstated students are not required to take these additional terms but are encouraged to do so in order to avoid taking an academic overload. Students are eligible to apply for financial aid for these additional terms.
   b. If a student is not cleared for return, a written explanation will be provided to help the student understand the reasons behind the Committee's decision and recommended steps they might take to be more successful in future requests.
6. **Appeals process** Most students are cleared to return. If a student is not cleared, they may appeal the decision. The appeal must be made in writing to the Dean of Yale College no later than seven (7) days from the date on which the student is notified of the decision. A student can also request reinstatement again in future terms.
7. **Returning from a disciplinary withdrawal** Students returning from a disciplinary withdrawal who fail to enroll in the term for which they were reinstated, or who cease to be enrolled on or before the fifteenth day of the term, will be placed on administrative withdrawal.

FINANCIAL WITHDRAWAL

University regulations require that all financial obligations to the University be paid as a condition of enrollment. Students who have not paid or made arrangements for payment of their term fees by the due date will be placed on financial withdrawal. See "Payment of Fees" under "Financial Services" in the Yale College Undergraduate Regulations. Students whose financial situations have changed should reach out to the Office of Financial Aid for a reassessment of their aid level.

1. **Duration of financial withdrawals** The financial withdrawal is lifted as soon as the student's financial obligations have been settled.

2. **Campus access** Students on financial withdrawal may be present on Yale's campus as guests or visitors and must follow all relevant university regulations as such. Students living in on-campus housing will have a few days (usually 72 hours) to vacate their room after withdrawing. If invited to campus by other students, students on withdrawal must abide by the three-day limit on guests, as stipulated in the Yale College Housing Regulations. Students on financial withdrawal may usually participate in undergraduate activities and registered student organizations

as guests but may not hold leadership positions or participate in university sponsored or funded international travel.

3. **Email and remote library access** Financially withdrawn students usually will retain email access for three years from the term of withdrawal. Remote library access is periodically reset to include only active students, dropping students who are withdrawn.

4. **Campus employment** Students on financial withdrawal may not hold student employment jobs but may work at Yale in other employment categories.

5. **Yale Summer Session classes** Students on financial withdrawal may not enroll in YSS classes.

6. **Finances** The financial consequences will depend on the timing of the withdrawal. See "Rebates of Undergraduate Charges" under "Financial Services" in the Yale College Undergraduate Regulations. Students receiving financial aid should contact the Office of Undergraduate Financial Aid. The office will help answer questions students may have regarding if and how their withdrawal might affect financial aid and help identify any impacts to their financial obligations (including student loan information). Students who have received long-term loans will be sent information about loan repayment obligations, which in most cases begin six months after the last day of formal enrollment at Yale.

7. **Disciplinary violations** A withdrawal does not preclude students from being charged with disciplinary violations of the Undergraduate Regulations in relevant circumstances.

8. **Parental notification** Due to the change in enrollment status, residential college deans ordinarily notify parents or guardians when a student is withdrawn.

9. **Health coverage** Students on financial withdrawal are not eligible for medical coverage or treatment through Yale Health.

RETURNING FROM A FINANCIAL WITHDRAWAL

Students are automatically reinstated once their financial obligations have been settled.

PERSONAL WITHDRAWAL

Students may withdraw from Yale College for personal reasons at any time in the term.

1. **Petition for personal withdrawals** Students should consult with their residential college dean, who can help them consider all options to determine whether a personal withdrawal is appropriate. In some cases, students considering a personal withdrawal may instead request a medical leave of absence or other accommodations. The consultation with the dean should include a discussion of the reinstatement requirements. If the student decides to pursue the personal withdrawal, they should submit a request in writing to their dean, who will forward it to the Committee on Honors and Academic Standing. Requests for personal withdrawals are ordinarily approved, but may be denied if the student is seeking to avoid an academic withdrawal.

2. **Coursework in process** Withdrawn students may not attend classes or submit additional coursework. Ordinarily, they are withdrawn from any courses in process.

See "Withdrawal and Leave of Absence from Yale College" under "Withdrawal from Courses" in the Yale College Academic Regulations. In some cases, when students have already completed all or most of the coursework for a given class, they may receive a grade based on the work already completed. See "Work Incomplete at the End of Term" under "Completion of Coursework" in the Yale College Academic Regulations. If grades are not already submitted, it will be up to the student to determine if they wish to accept the grade for work completed.

3. **Duration of personal withdrawals** Students on withdrawal for personal reasons usually must remain away for at least one fall term and one spring term, in either order, not including the term in which the withdrawal occurred. They may choose to stay away longer. They may also choose to reapply for early reinstatement, which may be granted in rare circumstances.

    a. *Note: Coursework Requirement for Students Away for More than Four Terms* Following an extended absence of any kind, students are required to prepare for their return by completing two term courses or their equivalent, either in Yale Summer Session or at another accredited, four-year, Bachelor's degree-granting college or university, and to receive grades of A or B. These courses must be completed and graded before the start of the term in which the student plans to return, and no more than two years before that date. Students should email the Committee on Reinstatement (reinstatement@yale.edu) with the details of the courses they plan to take, including the institution, in order to verify that the courses will meet the requirements. Students facing availability issues and/or financial hardship may petition to take courses at a community college. Students on financial aid who are required to complete coursework will have their Student Share waived for the year in which they are reinstated.

4. **Campus access** Students on personal withdrawal may be present on Yale's campus as guests or visitors and must follow all relevant university regulations as such. Students living in on-campus housing will have a few days (usually 72 hours) to vacate their room after withdrawing. If invited to campus by other students, students on withdrawal must abide by the three-day limit on guests, as stipulated in the Yale College Housing Regulations. Students on personal withdrawal may usually participate in undergraduate activities and registered student organizations as guests but may not hold leadership positions or participate in university sponsored or funded international travel.
5. **Email and remote library access** Personally withdrawn students usually will retain email access for three years from the term of withdrawal. Remote library access is periodically reset to include only active students, dropping students who are withdrawn.
6. **Campus employment** Students on personal withdrawal may not hold student employment jobs but may work at Yale in other employment categories.
7. **Yale Summer Session classes** Students on a personal withdrawal are eligible to enroll in Yale Summer Session.
8. **Finances** The financial consequences will depend on the timing of the withdrawal. See "Rebates of Undergraduate Charges" under "Financial Services" in the Yale College Undergraduate Regulations. Students receiving financial aid should contact the Office of Undergraduate Financial Aid. The office will help answer questions

students may have regarding if and how their withdrawal might affect financial aid and help identify any impacts to their financial obligations (including student loan information). Students who have received long-term loans will be sent information about loan repayment obligations, which in most cases begin six months after the last day of formal enrollment at Yale.

9. **Disciplinary violations** A withdrawal does not preclude students from being charged with disciplinary violations of the Undergraduate Regulations in relevant circumstances.
10. **Parental notification** Due to the change in enrollment status, residential college deans ordinarily notify parents or guardians when a student is withdrawn.
11. **Health coverage** Students on personal withdrawal are not eligible for medical coverage or treatment through Yale Health.

RETURNING FROM A PERSONAL WITHDRAWAL

1. **Timing of return** Students wishing to return from a personal withdrawal may request to do so when they feel ready. Requests to return early will be considered but are granted only in exceptional circumstances. There is no time limit on how long a student may remain withdrawn.

    a. Returns must be at the start of a fall or spring term. (Yale Summer Session classes do not require reinstatement.)

    b. Note: A student withdrawn from Yale College with pending disciplinary charges will not be eligible for to return to Yale College or to receive a Yale College degree until the student's case has been adjudicated by the Yale College Executive Committee or the University-Wide Committee on Sexual Misconduct.

2. **Deadlines for requesting reinstatement** To return for a fall term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on June 1. To return for a spring term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on November 1. These deadlines are#strictly enforced. Students who are unable to submit a complete request by the deadline may write to reinstatement@yale.edu, explaining the cause of the delay and asking for an extension, recognizing that extensions will only be granted in exceptional circumstances.
3. **Materials to be submitted**
    a. Online *Reinstatement Request* form. Email reinstatement@yale.edu to request form.
    b. Brief statement (approximately 500-750 words) describing the circumstances that led to the personal withdrawal, the activities pursued while away, and the student's own sense of their readiness to return to Yale College.
    c. *For students who have been away for more than four terms* Verification that the student has completed two term courses or their equivalent, either in Yale Summer Session or at another accredited, four-year, Bachelor's degree-granting college or university, with grades of A or B. Courses may be in process at the time of the request but must be completed and the grades received before the start of the term in which the student wishes to return. (See details above.)

4. **Individual assessment of request** The Committee on Reinstatement will review all the information provided, make an individualized determination as to whether the student has met the criteria to be cleared for return, and notify the student.
   a. When the Committee on Reinstatement clears a student for return, they will assess the number of remaining course credits and allocate additional terms of enrollment as necessary. Reinstated students are not required to take these additional terms but are encouraged to do so in order to avoid taking an academic overload. Students are eligible to apply for financial aid for these additional terms.
   b. If a student is not cleared for return, a written explanation will be provided to help the student understand the reasons behind the Committee's decision and recommended steps they might take to be more successful in future requests.
5. **Appeals process** Most students are cleared to return. If a student is not cleared, they may appeal the decision. The appeal must be made in writing to the Dean of Yale College no later than seven (7) days from the date on which the student is notified of the decision. A student can also request reinstatement again in future terms.
6. **Returning from a personal withdrawal** Students returning from a personal withdrawal who fail to enroll in the term for which they were reinstated, or who cease to be enrolled on or before the fifteenth day of the term, will be placed back on personal withdrawal.

ADMINISTRATIVE WITHDRAWAL

Students in academic good standing will be administratively withdrawn if they fail to register for classes by the add/drop deadline, or if they are absent from campus without advance permission from the Committee on Honors and Academic Standing for more than fourteen consecutive days during a period when classes are in session. Students who do not return to campus after reaching the limit of four terms of leaves of absence will also be administratively withdrawn (Medical leaves of absence do not have a term limit.)

1. **Duration of administrative withdrawals** Students on withdrawal for administrative reasons usually must remain away for the term in which the withdrawal occurred. They may choose to stay away longer.
   a. *Note: Coursework Requirement for Students Away for More than Four Terms* Following an extended absence of any kind, students are required to prepare for their return by completing two term courses or their equivalent, either in Yale Summer Session or at another accredited, four-year, Bachelor's degree-granting college or university, and to receive grades of A or B. These courses must be completed and graded before the start of the term in which the student plans to return, and no more than two years before that date. Students should email the Committee on Reinstatement (reinstatement@yale.edu) with the details of the courses they plan to take, including the institution, in order to verify that the courses will meet the requirements. Students facing availability issues and/or financial hardship may petition to take courses at a community college. Students on financial aid who are required to complete coursework will have their Student Share waived for the year in which they are reinstated.

2. **Campus access** Students on administrative withdrawal may be present on Yale's campus as guests or visitors and must follow all relevant university regulations as such. Students living in on-campus housing will have a few days (usually 72 hours) to vacate their room after withdrawing. If invited to campus by other students, students on withdrawal must abide by the three-day limit on guests, as stipulated in the Yale College Housing Regulations. Students on administrative withdrawal may usually participate in undergraduate activities and registered student organizations as guests but may not hold leadership positions or participate in university sponsored or funded international travel.
3. **Email and remote library access** Administratively withdrawn students usually will retain email access for three years from the term of withdrawal. Remote library access is periodically reset to include only active students, dropping students who are withdrawn.
4. **Campus employment** Students on administrative withdrawal may not hold student employment jobs but may work at Yale in other employment categories.
5. **Yale Summer Session classes** Students on an administrative withdrawal are eligible to enroll in Yale Summer Session.
6. **Finances** The financial consequences will depend on the timing of the withdrawal. See "Rebates of Undergraduate Charges" under "Financial Services" in the Yale College Undergraduate Regulations. Students receiving financial aid should contact the Office of Undergraduate Financial Aid. The office will help answer questions students may have regarding if and how their withdrawal might affect financial aid and help identify any impacts to their financial obligations (including student loan information). Students who have received long-term loans will be sent information about loan repayment obligations, which in most cases begin six months after the last day of formal enrollment at Yale.
7. **Disciplinary violations** A withdrawal does not preclude students from being charged with disciplinary violations of the Undergraduate Regulations in relevant circumstances.
8. **Parental notification** Due to the change in enrollment status, residential college deans ordinarily notify parents or guardians when a student is withdrawn.
9. **Health coverage** Students on administrative withdrawal are not eligible for medical coverage or treatment through Yale Health.

RETURNING FROM AN ADMINISTRATIVE WITHDRAWAL

1. **Timing of return** Students wishing to return from an administrative withdrawal may request to do so when they feel ready. There is no time limit on how long a student may remain withdrawn.
   a. Returns must be at the start of a fall or spring term. (Yale Summer Session classes do not require reinstatement.)
   b. Note: A student withdrawn from Yale College with pending disciplinary charges will not be eligible for to return to Yale College or to receive a Yale College degree until the student's case has been adjudicated by the Yale College Executive Committee or the University-Wide Committee on Sexual Misconduct.
2. **Deadlines for requesting reinstatement** To return for a fall term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on

June 1. To return for a spring term, reinstatement requests and all accompanying materials must be submitted by 5 p.m. (EST) on November 1. These deadlines are strictly enforced. Students who are unable to submit a complete request by the deadline may write to reinstatement@yale.edu, explaining the cause of the delay and asking for an extension, recognizing that extensions will only be granted in exceptional circumstances.

3. **Materials to be submitted**
   a. Online *Reinstatement Request* form. Email reinstatement@yale.edu to request form.
   b. Brief statement (approximately 500-750 words) describing the circumstances that led to the administrative withdrawal, the activities pursued while away, and the student's own sense of their readiness to return to Yale College.
   c. *For students who have been away for more than four terms* Verification that the student has completed two term courses or their equivalent, either in Yale Summer Session or at another accredited, four-year, Bachelor's degree-granting college or university, with grades of A or B. Courses may be in process at the time of the request but must be completed and the grades received before the start of the term in which the student wishes to return. (See details above.)
4. **Individual assessment of request** The Committee on Reinstatement will review all the information provided, make an individualized determination as to whether the student has met the criteria to be cleared for return, and notify the student.
   a. When the Committee on Reinstatement clears a student for return, they will assess the number of remaining course credits and allocate additional terms of enrollment as necessary. Reinstated students are not required to take these additional terms but are encouraged to do so in order to avoid taking an academic overload. Students are eligible to apply for financial aid for these additional terms.
   b. If a student is not cleared for return, a written explanation will be provided to help the student understand the reasons behind the Committee's decision and recommended steps they might take to be more successful in future requests.
5. **Appeals process** Most students are cleared to return. If a student is not cleared, they may appeal the decision. The appeal must be made in writing to the Dean of Yale College no later than seven (7) days from the date on which the student is notified of the decision. A student can also request reinstatement again in future terms.
6. **Returning from an administrative withdrawal** Students returning from an administrative withdrawal who fail to enroll in the term for which they were reinstated, or who cease to be enrolled on or before the fifteenth day of the term, will be placed back on administrative withdrawal.

U.S. MILITARY SERVICE REINSTATEMENT POLICY

Students who interrupt their studies to perform U.S. military service are subject to a separate U.S. military leave reinstatement policy.

In the event that a student withdraws or takes a leave of absence from Yale College on or after August 14, 2008, in order to serve in the U.S. military, the student will be entitled to guaranteed reinstatement under the following conditions:

1. Students must have served in the U.S. Armed Forces for a period of more than thirty consecutive days.
2. Students must give advance written or verbal notice of such service to their residential college dean. In providing the advance notice students do not need to indicate whether they intend to return. This advance notice need not come directly from the student, but, rather, can be made by an appropriate officer of the U.S. Armed Forces or official of the U.S. Department of Defense. Notice is not required if precluded by military necessity. In all cases, this requirement of giving notice can be fulfilled at the time the student seeks reinstatement, by submitting an attestation that the student performed the service.
3. Students must not be away from the University to perform U.S. military service for a period exceeding five years (this includes all previous absences to perform U.S. military service but does not include any initial period of obligated service). If a student's time away from the University to perform U.S. military service exceeds five years because the student is unable to obtain release orders through no fault of the student, or the student was ordered to or retained on active duty, such students should contact their residential college dean to determine if they remain eligible for guaranteed reinstatement.
4. Students must notify Yale within three years of the end of the U.S. military service of their intention to return. However, students who are hospitalized or recovering from an illness or injury incurred in or aggravated during the U.S. military service have up until two years after recovering from the illness or injury to notify Yale of their intent to return.
5. Students may not have received a dishonorable or bad conduct discharge or have been sentenced in a court-martial.

A student who meets all of these conditions will be reinstated for the following term unless the student requests, in writing, a later date of reinstatement. Any student who fails to meet one of these requirements may still be eligible for reinstatement under Yale's general reinstatement policy but is not guaranteed reinstatement. Upon returning to Yale, such students will resume their education without repeating completed course work for courses interrupted by U.S. military service. They will have the same enrolled status last held and will be in the same academic standing. For the first academic year in which such students return, they will be charged the tuition and fees that would have been assessed for the academic year in which they left the institution. Yale may charge up to the amount of tuition and fees that other students are assessed, however, if veterans' education benefits will cover the difference between the amounts currently charged other students and the amount charged for the academic year in which the student left. In the case of students who are not prepared to resume their studies with the same enrollment status and academic standing as when they left or who will not be able to complete the program of study, Yale will undertake reasonable efforts to help such students become prepared. If, after reasonable efforts, Yale determines that the student remains unprepared or will be unable to complete the program, or Yale determines that there are no reasonable efforts it can take, Yale may deny reinstatement.

REBATES OF UNDERGRADUATE CHARGES

For information on financial rebates on account of withdrawal from Yale College, consult the section "Financial Services," under "Regulations," in the Yale online publication Undergraduate Regulations.

K. Special Academic Programs

YEAR OR TERM ABROAD

In recognition of the value of international study, Yale College encourages students to spend an academic year or a term studying on an approved program abroad. In order to participate in a Year or Term Abroad, students must have secured both approval from Yale Study Abroad and admission from an accredited study abroad program.

A term abroad may be taken only during the second term of the sophomore year, either the first or second term of the junior year, or the first term of their senior year; students may combine any two of these four terms for a year abroad. Students may only enroll abroad as a senior if attending the Yale in London program.* Students who wish to take a term abroad during the first term of their senior year should consult closely with their DUS(s) and their residential college dean to ensure timely fulfillment of their degree requirements. Students must enroll in Yale courses for the final term of enrollment. Students are not eligible to participate in a Year or Term Abroad when on disciplinary probation or during a leave of absence. Students are limited to a maximum of two terms abroad for Yale graduation credit transfer and financial aid transfer.

Students in any major may apply. Students must be in academic good standing at the start of an approved year or term abroad and be able to return to enrollment at Yale in academic good standing. See section D, Promotion and Good Standing, "Requirements for Academic Good Standing." Students must have at least a B average at the time of their application. Applicants with a cumulative GPA below 3.0 are asked to submit an additional short essay that addresses their academic performance at Yale and outlines specific strategies for maintaining academic good standing abroad. The transcript should demonstrate progress toward raising the GPA in the terms before the intended year or term abroad. Applicants should ensure that they also meet the GPA requirement of their intended study abroad program(s).

Students seeking to study abroad in a country where the primary language is not English are required to take at least one course studying the language of the host country while abroad.

The credit application for a Year or Term Abroad is available on the Yale Study Abroad website. A complete application includes all of the following: the application for credit, including a statement concerning the proposed course of study; a recommendation form from the student's director(s) of undergraduate studies; and a recommendation form from the student's residential college dean. Students on Yale financial aid must also submit a Year or Term Abroad Budget for Financial Aid to the Office of Undergraduate Financial Aid. Approval from Yale Study Abroad is contingent upon the Yale Travel Policy and the student's acceptance into a program or university abroad. Students must complete additional pre-departure requirements before arrival in the host country.

Application deadlines are listed in the Yale College Calendar with Pertinent Deadlines and on the Yale Study Abroad website.

Applications for programs or universities abroad are available directly from the sponsoring institutions. Information about specific programs and contact information for past Yale participants are available on the Yale Study Abroad website. Note that application deadlines differ from program to program and usually also differ from the Yale Study Abroad deadline. Students are responsible for meeting the deadlines set by the programs they seek to attend, whether those deadlines fall before or after the Yale Study Abroad deadline.

At a minimum, programs must involve full-time work at the university level and must be undertaken during the host program's regular academic year. Students should note that programs in the Southern Hemisphere are subject to a different academic calendar, one of which may include the months of June, July, and August. Students should choose from the list of designated programs available on the Yale Study Abroad website. Students applying to enroll in programs not on the designated list must meet with a study abroad adviser to discuss the program and submit a petition application by the stated deadline. Yale Study Abroad evaluates programs primarily on the quality and structure of their academic offerings as well as the host country's eligibility under the Yale Travel Policy. Study abroad advisers are available to assist students in selecting an appropriate program.

1. **Course credit from a Year or Term Abroad** Students on a year abroad who complete a full program of study for the equivalent of two terms of enrollment at Yale may earn up to nine course credits. Students on a term abroad who complete a full program of study for the equivalent of one term of enrollment at Yale may earn up to four and a half course credits (with the exception of Cambridge or Oxford, for which students may earn five credits). What Yale Study Abroad considers a full program of study varies from program to program due to differences in academic credit systems. Students should consult with a study abroad adviser to ensure that they are enrolled in a full program abroad.
2. **Course Credit from a Summer Abroad** Students may earn credit through study abroad in a Yale Summer Session program abroad or in an approved non-Yale program. Yale Summer Session courses are not considered outside courses, and there is no limit on the number of such courses that a student may offer toward the requirements of the bachelor's degree. For approved non-Yale programs, students may earn up to two course credits in a single summer. As an exception, students who wish to study abroad during a second or third summer may earn additional course credits in approved non-Yale summer abroad programs with the support of Study Abroad and by petition to the Committee on Honors and Academic Standing through their residential college dean's office. In no case may a student earn a total of more than nine credits from non-Yale study abroad, term-time and summer, or earn more than two non-Yale study abroad credits in a single summer.
3. **Other course credit from outside Yale** Approved Year or Term Abroad enrollment is the only arrangement by which students may apply more than two outside credits toward the thirty-six course credits required for the bachelor's degree.* Students receiving credit for a year abroad may not apply any other credits from outside Yale toward the 36-course-credit requirement. Students receiving credit for a term

abroad may apply up to two other course credits from outside Yale toward the 36-course-credit requirement. Because the maximum number of outside credits allowed is nine, students who have previously transferred one or two outside credits are normally eligible only for one term abroad. Students who wish to take a year abroad, but who are ineligible by virtue of having already transferred one or two outside credits may, with the exception noted below†, request that the University Registrar remove such credit from the transcript by petitioning the Committee on Honors and Academic Standing through their dean's office. If that petition is approved, the Registrar will remove the relevant outside course credit, but the course title will remain on the transcript. Accordingly, this coursework may also continue to be applied toward major and distributional requirements.

4. **Evidence of coursework** The approved study abroad program or university must submit to Yale Study Abroad such evidence of the student's achievement as transcripts or other official academic records.
5. **Grades** No credit will be awarded for a course in which the grade earned was lower than a C- or its equivalent in other grading scales. Nor will credit be awarded for a course taken on a Pass/Fail option, if the student had the choice of taking the course for a letter grade.
6. **Distributional requirements and major requirements** In addition to applying credits earned on a year or term abroad toward the 36-course-credit requirement, students may, with appropriate permissions, apply these course credits toward fulfillment of distributional requirements and some of the requirements of their major programs. Instructions on applying such credit toward the distributional requirements are available on the Fulfilling Requirements With Outside Credit page; petitions for credit toward major requirements should be directed to the relevant director of undergraduate studies. Students interested in fulfilling requirements through study abroad coursework should be prepared to provide on their return to Yale copies of all coursework and syllabi.
7. **Academic regulations** Because a year or term abroad counts as the equivalent of two or one terms of enrollment in Yale College, the academic regulations of Yale College pertain to enrollment abroad. Students must earn a sufficient number of credits abroad to remain in academic good standing. Failure to do so will result in academic warning or dismissal for academic reasons. See section I, Academic Penalties and Restrictions. Withdrawal from an approved program abroad has the same consequences as withdrawal from Yale College.
8. **Canceling a Year or Term Abroad** Students who have received permission to study abroad but later decide not to do so must notify Yale Study Abroad and their residential college dean in writing of their change of plans, and then either enroll as usual in Yale College or apply for a leave of absence before the deadline. See section J, Time Away and Return. In some cases, such students will have to withdraw from Yale College if the deadline for requesting a leave has passed, or if they have already taken four terms of leave, or if the deadline for enrolling in courses in Yale College has passed. Under no circumstances can a Year or Term Abroad be converted retroactively to a leave of absence. Similarly, a leave of absence cannot be converted retroactively to a Year or Term Abroad.
9. **Enrollment in Yale College after a Year or Term Abroad** After returning from a year or term abroad, students must enroll in Yale College for at least one term.

Students who have accelerated should speak with their residential college dean about the possible need to decelerate. See section Q, Acceleration Policies.

10. **Financial aid** Students who have been approved to study abroad and who receive financial aid from Yale are eligible for aid while abroad. Information about financial aid support can be found on the Undergraduate Financial Aid website.

* Study during the spring term at the Paul Mellon Centre for Studies in British Art in London (Yale in London) is equivalent to enrollment in Yale College and is not considered a Term Abroad. Application to the Yale in London program should be made directly to that office at the Yale Center for British Art. For details, see the British Studies program description.

† Students on promotion hold who employ outside course credits to repair a credit deficiency cannot subsequently have those credits removed from their transcript for any reason and are thus ineligible to take a year abroad.

LIMIT ON RESIDENTIAL COLLEGE SEMINARS

Residential College Seminars are limited in number and high in demand. Consequently, students may enroll in no more than four such seminars in total and no more than one per term. Students who seek an exception to these limits must secure special permission from the Director of the Residential College Seminar program (jasmina.besirevic@yale.edu) to enroll in more than one residential college seminar per term, and must petition the Yale College Committee on Honors and Academic Standing, through their residential college dean's office, to enroll in more than four such seminars in total.

Auditing is not permitted in residential college seminars.

LIMIT ON FIRST-YEAR SEMINARS

First-Year Seminars are limited in number and high in demand. Consequently, a student may enroll in no more than one first-year seminar per term, and no more than two during their first year at Yale College. Exceptions require special permission from the Director of the First-Year Seminar program (jasmina.besirevic@yale.edu).

Auditing is not permitted in first-year seminars.

COURSES IN YALE SUMMER SESSION

There is no limit on the number of Yale Summer Session courses, on-campus or online or through a Yale Summer Session Program Abroad, that a Yale College student may offer toward the requirements for the bachelor's degree. All courses completed by Yale College students in Yale Summer Session will be entered on the Yale College record, and those taken for a grade will be included in the calculation of the student's eligibility for General Honors and Distinction in the Major. This includes courses taken by incoming Yale College students after their admission to, and prior to their first term of enrollment in, Yale College. Courses outside of a student's major, successfully completed in Yale Summer Session, may be counted toward the requirements of the student's major program with the permission of the student's director of undergraduate studies. Yale Summer Session courses within the student's major count toward the major. Courses taken for a grade may also be counted toward fulfilling distributional requirements.

Yale Summer Session courses selected as Credit/D/Fail will count toward the four-course-credit limit on Credit/D/Fail courses for the bachelor's degree. This includes courses taken as Credit/D/Fail by incoming Yale College students after their admission to, and prior to their first term of enrollment in, Yale College. Marks of CR are included in the calculations for some prizes, for Distinction in the Major, and for election to Phi Beta Kappa as non-A grades, but marks of CR are not included in the calculation for General Honors. Courses taken on a Credit/D/Fail basis may not be counted toward fulfilling distributional requirements for the junior year nor toward satisfaction of the distributional requirements for the bachelor's degree. For details on the Credit/D/Fail option in Yale Summer Session, see the Student Handbook on the Yale Summer Session website.

Attendance at Yale Summer Session does not constitute a term of enrollment in Yale College. Thus a student accelerating by one term by use of acceleration credits may not offer attendance at Yale Summer Session as one of the required seven terms of enrollment in Yale College.

A student accelerating by the early accumulation of thirty-six course credits may count credits earned in Yale Summer Session toward such acceleration. See section Q, Acceleration Policies, "Acceleration by the Early Accumulation of Thirty-Six Course Credits."

There are no auditing privileges in Yale Summer Session.

Students are advised to refer to the Yale Summer Session website for Yale Summer Session's academic regulations, as well as other deadlines, policies, and procedures.

YALE IN LONDON SUMMER PROGRAM

Courses in the summer program at the Paul Mellon Centre for Studies in British Art in London carry full Yale course credit, but enrollment in the Yale in London summer program does not constitute a term of enrollment in Yale College. (Attendance at the Yale College program at the Paul Mellon Centre in London during a spring term does count as a regular term of enrollment.) Thus a student accelerating by one term by use of acceleration credits may not offer attendance at the summer program at the Paul Mellon Centre in London as one of the required seven terms of enrollment in Yale College.

A student accelerating by the early accumulation of thirty-six course credits may count credits earned in the summer program at the Paul Mellon Centre in London toward such acceleration. See section Q, Acceleration Policies, "Acceleration by the Early Accumulation of Thirty-Six Course Credits."

FIELDS & DIRECTED INDEPENDENT LANGUAGE STUDY

Through the Center for Language Study, students may apply to two special language programs: (1) Directed Independent Language Study (DILS), to study a language not taught in a department at Yale; and (2) the Fields program, for discipline-specific language study at advanced levels. For both programs, the selection process is competitive; students submit an application to the committee, which considers the strength of the applicant's academic or professional reasons for their proposed course of study. Students are expected to be self-motivated and to spend significant time on their DILS or Fields study. During the program, students meet with an educated

native speaker—a language partner—for two hours per week of conversation, while also studying the language on their own. In consultation with their language partner and the program manager, students devise their own plan of study and locate study materials, including conventional textbooks and web-based language materials. Fields students are tested at the end of their program using a nationally recognized oral proficiency examination. In Fields, students are also tested at entrance to confirm advanced proficiency. Both programs are open to undergraduates, graduate students, and professional school students. Language study through DILS and Fields is not eligible for course credit, does not satisfy the Yale College language requirement, does not appear on transcripts, and cannot be applied toward the Advanced Language Certificate. Interested students should apply at cls.yale.edu/dils and cls.yale.edu/fields.

AUDITING

Auditors are not permitted in courses taught in Yale College except for persons in one of the categories described below.

Category 1. Students enrolled full time in Yale College or in one of the graduate or professional schools of the University. In this case, students should contact the instructor directly for permission; with approval of the instructor, no form or additional permission is needed.

Category 2. Current members of the Yale faculty and emeritus faculty. In this case, the permission of the instructor is the only requirement; no form or additional permission is needed.

Category 3. Spouses of full-time Yale faculty members, or of emeritus faculty, or of students enrolled full time in the University. In these cases, the permission of both the instructor and the Director of the Yale College Auditing Program (academic.affairs@yale.edu) is required.

Category 4. Employees of the University and their spouses, in accordance with applicable personnel policies. In these cases, the permission of the instructor, the employee's supervisor, and the Director of the Yale College Auditing Program (academic.affairs@yale.edu) is required.

Category 5. Spouses of postdoctoral associates and fellows. In these cases, permission of both the instructor and the Director of the Yale College Auditing Program (academic.affairs@yale.edu) is required.

Category 6. Yale University alumni and their spouses. In these cases, permission of both the instructor and the Director of the Yale College Auditing Program (academic.affairs@yale.edu) is required, and an auditing fee will be charged.

Those in Categories 1 and 2 should contact the instructor of the course directly; only those in Categories 3, 4, 5, and 6 must complete an auditing form. The form for Categories 3, 4, and 5 (affiliate auditing) is available at the Yale Affiliate Auditing Program website; the form for Category 6 (alumni) is available at the Yale Alumni Auditing Program website.

No other persons are permitted to audit courses in Yale College, except for alumni eligible for the Alumni Auditing program. The Alumni Auditing program is

administered separately from the general auditing program, and different rules may apply.

No auditors are permitted in any Yale Summer Session courses.

Yale NetIDs cannot be assigned to auditors. Alumni auditors pay a fee, which allows access to classroom sessions and to the Canvas class website, but only to course materials that are published to Canvas and available without Yale NetID access. Accordingly, many course resources (e.g., streaming video, library databases, "Zoo" computer labs, etc.) are not available to auditors. Before paying their auditing fee, and in order to make an informed decision about auditing a course, alumni auditors are encouraged to ask instructors whether such NetID-based resources will be used. More information is available at the Yale Alumni Auditing Program website.

All auditors are responsible for any additional course-based fees; those fees are paid directly to the sponsoring school, and not to the Yale College Auditing Program Office. Course fees can be found in the course description via Yale Course Search.

Persons auditing courses with limited laboratory or computer facilities must secure the explicit permission of the instructor to do so, and should understand that regularly enrolled students must at all times have priority in using such facilities. Computer or language laboratory facilities should be employed by auditors only during times when they are not in heavy demand, and in certain courses charges for computer use may be necessary. General access to the campus computing network may not be available to auditors.

It is the usual expectation that an auditor does not take tests or examinations or write papers for a course for evaluation by the instructor. Occasionally, however, an auditor may wish to do such work and may request the instructor to evaluate it. If the instructor wishes to cooperate with the auditor in this way, the instructor does so on a voluntary basis and not as an obligation.

The University Registrar's Office does not keep a record of courses audited. It is not possible, therefore, for a student's transcript to show that a course has been audited, or for a transcript to be issued that records the auditing of a course.

The Yale College Auditing Program Office oversees only the auditing of undergraduate courses. To audit courses in Yale Graduate or Professional schools, contact those school registrars directly.

Persons interested in auditing an undergraduate course should review the Yale Alumni Auditing Program website or the Yale Affiliate Auditing Program website.

L. Special Academic Arrangements

Combined Bachelor's and Master's Degree Programs in the Professional Schools

Well-qualified students may be able to structure their undergraduate programs to become eligible for a master's degree in African Studies, Environmental Management or Environmental Science, Global Affairs, Music, or Public Health after one additional

year of graduate study at Yale. For more information see the respective program descriptions in Subjects of Instruction or on the respective websites.

COMPLETION OF DEGREE REQUIREMENTS AT THE END OF A FALL TERM

Students who at the end of a fall term complete the requirements for graduation may be of three kinds: (1) those who complete such requirements in eight terms of regular enrollment; (2) those who have accelerated; and (3) students admitted by transfer to Yale College and students whose admission to Yale College was deferred until a spring term; see section Q, Acceleration Policies. The following rules apply to students of these three kinds.

1. **Notification by the student** Students must, by the fifteenth day in their final term of enrollment, complete a Petition to Complete Degree Requirements at the End of a Fall Term to notify the Committee on Honors and Academic Standing through their residential college dean's office that the fall term will be that student's last term of enrollment. Notification must include written certification from the student's director of undergraduate studies that the student will have completed all the requirements of the major program by the end of the fall term, and from the student's residential college dean that the student will have fulfilled the distributional requirements by that time. Failure to observe the deadline will result in the students being charged a fine of $20.
2. **Award of degrees and diplomas** Students who complete degree requirements at the end of a fall term are awarded their degrees after all grades are reported and degree requirements are met. Any degree requirements that aren't completed, including resolution of final grades, by January 31 for students who applied to have their degree conferred in December will become if and when students and will not have their degree conferred with the December degree conferral date. Degree clearance can take several weeks. Students should check their unofficial transcripts to determine if the degree has been awarded before ordering official transcripts. Diplomas are mailed to students at the diploma address they provide. Students who have their degree conferred at the end of a fall term are considered to be members of the class that graduates during that academic year, the same as the May graduates. Eligibility for General Honors will be based on the criteria of the most recent graduating class. If a student who completes degree requirements at the end of a fall term wishes to participate in the Commencement exercises held in the previous academic year, the student may do so with the permission of the residential college head and dean. Such might be the case, for example, for students who because of a leave of absence did not qualify for graduation with the class in Yale College with which they entered as a first-year.

COURSES IN THE YALE GRADUATE AND PROFESSIONAL SCHOOLS

To comply with federal regulations, the University Registrar's Office does not retroactively adjust student records. Accordingly, students who are enrolled in cross-listed courses (e.g., courses with both a Graduate School and Yale College course number and/or courses taught in two or more different departments) must ensure that they are enrolled under the appropriate course number. The deadline to change school

levels (Graduate School or Yale College) or departments is the last day of classes in the corresponding term of enrollment.

A student may request to elect a graduate or professional school course, other than those designated independent study, by entering the course on the Course Schedule Selection Form. Students who wish to elect a professional school course (except for the School of Management) must also complete an additional form available on the University Registrar's Office website. This additional form must be completed by the student, signed by the course instructor, and must also be signed by the appropriate agent of the dean or the registrar of the school in which the course is offered. Students who wish to elect a School of Management course should visit the School of Management website.

Requests should be made as early as possible in the term in which enrollment is sought and not later the last day of add/drop period. In recognition of the need to have a student's schedule of courses finalized promptly, forms that are submitted after this date or that are incomplete will normally not be approved. Exceptions require action of the Committee on Honors and Academic Standing, in response to a petition from the student, and incur a $5 daily processing fee.

Note that systems for the award of course credit in the professional schools differ and that not all courses in these schools yield a full course credit in Yale College. Once all materials for a request to elect a professional school course are received by the Office of the University Registrar, a review will be made and the student will be informed as to whether the course will earn Yale College course credit and, if so, how much. Courses that earn no Yale College credit will normally not be entered on the Yale College transcript.

Note also that Yale College students are not permitted to enroll in independent study courses in the Graduate School of Arts and Sciences or in any of the professional schools of the University, unless already accepted into the program for the simultaneous award of the bachelor's and master's degrees. Enrollment in graduate or professional school courses does not typically earn credit toward Yale College distributional requirements (see section A, Distributional Requirements, no. 8). While such courses may count toward the undergraduate degree, the director of undergraduate studies of a department may determine whether they also count toward major requirements.

Options for Undergraduates	**Yale College Courses**	**Graduate/Professional School Courses**
Can I enroll under the Credit/D/Fail option?	Yes, see Section B, Credit/D/Fail Option	No
Can I take an independent study course?	Yes, see Section C, Normal Program of Study	No, unless already accepted into the simultaneous degree program; see Section L, Courses in the Yale Graduate and Professional Schools

Can I earn credit toward distributional requirements?	Yes, see Section A, Distributional Requirements	No, unless instructor has secured approval from Yale College in advance of the start of term; see Section A, Distributional Requirements, no. 8

A student may offer as many as four course credits earned in professional schools of the University toward the 36-course-credit requirement for the bachelor's degree. Courses taken in the Graduate School of Arts and Sciences are not included in this four-credit restriction.

The deadlines and regulations of Yale College are binding on all students, including candidates for the simultaneous award of the bachelor's and master's degrees, in regard to courses in which they are enrolled in the Graduate School of Arts and Sciences and the professional schools of the University. These include the deadlines and regulations pertaining to withdrawal from courses, late or postponed work, and work incomplete at the end of term. An exception in deadline may be made in a course offered in a professional school of the University in which the academic calendar differs from that of Yale College. A request for such an exception must be grounded in compelling academic reasons, and must be made in writing by the instructor of the course to the student's residential college dean in advance of the deadline in question. Instructors of courses in the Graduate School and in the professional schools of the University are expected to use the Yale College grading system when they report grades for undergraduates who have completed their courses. While undergraduate students may enroll, with the instructor's permission, in half-term professional or graduate school courses, they may not enroll in full or partial-term courses that conclude in the middle of the following term.

CURRICULAR COMBINATIONS AND COURSE OVERLAP ALLOWANCES

Specific combinations of majors, two majors, skills-based and interdisciplinary certificates, and simultaneous degrees enable students to configure combinations that will best serve the purposes of a liberal arts education. By establishing limits comprised of three combinations of curricular options, students are better able to organize their interests into coherent sets of courses.

The following combinations of three are allowed without special permissions: one major and two certificates; two majors and one certificate; a simultaneous Bachelor's and Master's Degree (B.A./M.A. or B.S./M.S.) and one certificate and a second major. Students may, in special circumstances, petition the Committee on Honors and Academic Standing for permission to earn an additional combination.

Additionally, no more than two course credits may overlap in the fulfillment of the requirements of a major, two majors, a certificate, or a simultaneous degree. Students may not apply the same course credit toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major.

DOUBLE CREDIT FOR A SINGLE-CREDIT COURSE

Two course credits for a course in Yale College normally carrying one course credit may be awarded to a student under the following conditions:

1. **Deadline** Permission must be requested by midterm, as published in the Yale College Calendar with Pertinent Deadlines. If granted, the request may not be reversed to convert back to a single credit course.
2. **Petition and approvals** The student's petition must be approved by the instructor of the course, the director of undergraduate studies in the instructor's department, and the Committee on Honors and Academic Standing. The petition should include a detailed syllabus and an explanation of how the student's proposed work represents at least twice the normal expectations of the course.
3. **Distributional requirements** When a petition for double credit is approved for a course that fulfills a distributional requirement, the additional credit may not be applied toward the distributional requirement, although it may be applied toward the 36-course-credit requirement for graduation.
4. **Multiple courses** A student may make use of this arrangement rarely, and no more than once or twice.

SIMULTANEOUS AWARD OF THE BACHELOR'S AND MASTER'S DEGREES

Students of distinguished ability in a limited number of departments may undertake graduate work that will qualify them for the simultaneous award of the bachelor's and master's degrees at the end of their senior year. The simultaneous degree can be conferred only in a single department or program and only in departments or programs that confer both degrees. For example, a student may not complete a bachelor's degree in Economics and a master's degree in Political Science, nor may a student combine a bachelor's degree in a multi-departmental major (e.g., Ethics, Politics, and Economics) with a master's degree in one of its constituent departments. A student pursuing a simultaneous degree may, however, complete two separate undergraduate majors as long as one of the undergraduate majors is in the same department as the master's degree. Currently, the following departments offer the simultaneous degree option: American Studies; Biomedical Engineering; Chemistry; Classics; Computer Science; East Asian Studies; Earth and Planetary Sciences; English Language and Literature; French; History; History of Art; Italian Studies; Linguistics; Mathematics; Molecular Biophysics and Biochemistry; Molecular, Cellular, and Developmental Biology; Music; Political Science; and Statistics and Data Science. For more information about this program, contact the relevant director of undergraduate studies or the associate dean of academic affairs.

1. **Eligibility** Applicants cannot be considered for admission unless by the end of their fifth term of enrollment they have achieved at least two-thirds A or A– grades in all of their course credits, as well as in all of the course credits directly relating to their major. Some participating departments have additional eligibility requirements, and students should consult the relevant director of undergraduate studies for this information. Because the Eli Whitney Students program is for enrollment for the degree of Bachelor of Arts (B.A.) or Bachelor of Science (B.S.) only, students in that

program are ineligible for the simultaneous award of the bachelor's and master's degrees. Please note that these are the *minimum* criteria for admission, and that the relevant department faculty may have additional criteria, or may need to place limits on the number of students they can recommend for candidacy.

Prior to admission to the program, students enrolling in a course that carries both an undergraduate and a graduate number must enroll under the graduate number if they wish to apply that course toward the graduate school requirements. The University Registrar's Office cannot change the course number on student records after the last day of classes in the corresponding term of enrollment.

Students who apply to this program should note that their work toward the master's degree will likely limit the opportunities for a wider distribution of studies over different subjects. For this reason, students who are accepted into candidacy and have a second major should strongly consider dropping their second major.

2. **Application** Students must apply to their department for admission to the program through their director of undergraduate studies and must complete the online application no later than the last day of classes in their fifth term of enrollment in Yale College. While there is no advantage to applying earlier in the term, this deadline is strictly enforced. The proposal should provide evidence of eligibility, reasons for pursuing the simultaneous degree, and plans for completing the program requirements. If the department acts favorably on the student's application, it is forwarded with the formal approval of the director of undergraduate studies and of the director of graduate studies to the associate dean of academic affairs in the Yale College Dean's Office, where a joint committee of Yale College and the Graduate School acts upon the department's nomination and notifies the student of acceptance into the program.
3. **Program requirements** Specific requirements for the award of degrees will be determined by each department. Normally a student is expected to complete the requirements of the undergraduate major in addition to eight or more course credits in the Graduate School; some departments, including the English and French departments, may require only seven course credits in the Graduate School. For all students in the program, graduate work must not be entirely concentrated in the final two terms.

   Students may not enroll in Yale College for more than eight terms in order to qualify for the simultaneous award of both degrees. It is possible to earn both degrees in fewer than eight terms, but not by the use of acceleration credits. Upon acceptance into the program, a student who has accelerated by the use of acceleration credits will automatically be decelerated, and may not, so long as the student remains in the simultaneous degree program, subsequently employ the credits to accelerate. While some participating departments may allow up to two overlapping term courses to apply to the requirements of both the major and the master's degree, and while students are not prohibited from additionally completing a second major, students may not apply two overlapping term courses toward the completion of both the simultaneous degree and toward completion of the two majors; only one such overlap is permitted (see Curricular Combinations and Course Overlap Allowances).
4. **Requirements for the master's degree** To qualify for the master's degree, students must normally complete eight term course credits in the Graduate School with

grades of A or A- in at least two term courses (or in one year course) and with a B average in the remaining ones. Students in those departments with a language requirement for the Ph.D. degree will be required to demonstrate proficiency in one of the specified languages.

5. **Approval of course schedules** Following notification that they have been accepted into the Program for the Simultaneous Award of the Bachelor's and Master's Degrees, students should have their course schedules approved each term both by the director of undergraduate studies and by the director of graduate studies.
6. **Independent Study** Students who have been admitted into the program may enroll in independent study courses in the graduate or professional school if the director of graduate studies verifies that such courses are applicable to the degree requirements for the master's degree.

SPECIAL TERM COURSES

With the approval of the Yale College Committee on Honors and Academic Standing, a student may arrange with a member of the faculty to take a Special Term Course, or individual tutorial, for credit toward the bachelor's degree, provided that certain requirements are met. First, the material of the proposed course must be appropriate to the qualifications of the student and it must be otherwise unavailable in the Yale University curriculum. If the subject can be pursued through independent study in an existing tutorial course in a department (e.g., AMST 4471 or CGSC 4730), the student must apply for enrollment in that course through the director of undergraduate studies. Second, the instructor of the proposed special course must hold a teaching appointment in the University. Third, the student must describe in detail the nature of the proposed coursework and submit a syllabus.

Requests for Special Term Courses should be made to the Committee on Honors and Academic Standing, through the residential college dean's office, on forms available from the residential college dean. The application form must be completed by the student and then approved and signed by the proposed instructor and the director of undergraduate studies of the instructor's department. A request for a Special Term Course should be made during the term immediately preceding the term during which the course is actually to be taken. An application will not be accepted by the committee after the second week of the term for which a course is proposed. It is expected that Special Term Courses will be taken for a letter grade. A student may not apply credit earned in a Special Term Course toward satisfaction of any of the distributional requirements.

TWO MAJORS

A student must petition the Committee on Honors and Academic Standing for permission to complete the requirements of two major programs. The Petition to Complete the Requirements of Two Majors is available on the University Registrar's Forms & Petitions site. A student contemplating the completion of two majors should bear in mind that doing so will almost invariably limit the opportunities for a wider distribution of studies over different subjects.

Each major must be completed independently of the other, with no more than two term courses overlapping. Prerequisites in either major are not considered to be overlapping courses. Other than such prerequisites, all courses taken in a major—including those

taken in excess of the minimum requirements of the major—are counted in the consideration of overlapping courses unless such courses are in excess of the minimum requirements for both majors. Overlapping courses may not include the senior essay or senior project, unless the essay or project is unusually substantial and represents at least the equivalent of the minimum essay or project requirement of the one major in addition to the minimum essay or project requirement of the other major. If a single senior essay or project is approved for the two majors, no additional overlap in course credits is permitted (see Curricular Combinations and Course Overlap Allowances). A joint senior project may earn no more than 3 course credits.

It is not possible to offer as two majors a combined major with one of its component majors. For example, a major in Economics and Mathematics cannot be joined with a second major in either Economics or Mathematics. Similarly, a student completing a major that permits the inclusion of a concentration of courses from another major or program cannot also major in that second major or program. For example, a major in Sociology with Psychology cannot have a second major in Psychology. A Special Divisional Major may not be offered as one of two majors.

A petition for two majors should show clearly how the requirements for each of the two programs will be met, and petitioners should consult the appropriate directors of undergraduate studies. The completion of two majors does not result in the award of two degrees; a student who completes a major that leads to the award of the B.A. degree and another major that leads to the award of the B.S. degree may choose the degree to be conferred. Students are strongly encouraged to consult with their residential college dean and with the director of undergraduate studies in both majors. A petition to complete the requirements of two majors should be made only after the student's plans are definite, but no later than the due date for course schedules in the student's final term of enrollment. Petitions submitted after this deadline will be accepted only by exceptional action of the Committee on Honors and Academic Standing and will be fined $50.

A student may not petition for permission to complete the requirements of more than two major programs.

M. Transfer Students

The following regulations apply to students admitted to Yale College by transfer from other colleges and universities:

1. **Degree requirements** In order to graduate from Yale College, transfer students must fulfill all the requirements for the bachelor's degree. They must thus earn a total of the equivalent of at least thirty-six course credits, that total consisting of the number of credits awarded for their work at their previous institutions combined with the number of course credits subsequently earned at Yale. They must also complete the requirements of a major program in Yale College and fulfill the distributional requirements for the bachelor's degree.
2. **Terms of enrollment at Yale** Transfer students are expected to enroll in Yale College for the number of terms designated at the time of the final credit evaluation made of their work at previous institutions. Under no circumstances may a transfer student complete fewer than four terms of enrollment in Yale College or earn fewer

than eighteen course credits at Yale. Transfer students are not eligible for the award of acceleration credit or for acceleration by use of acceleration credits.

3. **Transfer of credits** A preliminary evaluation of transferable credits is made at the time of the student's admission. Final determination of transfer credits is completed when all official transcripts from a student's previous institutions have been received.
4. **Additional terms at Yale** Students who must remain at Yale beyond the terms designated in the final determination of transfer credits must petition the Committee on Honors and Academic Standing for permission to do so. Such a petition will be considered only if it is impossible for the student to complete the requirements for the bachelor's degree in the designated number of terms. See section A, Requirements for the B.A. or B.S. Degree, "Eight Terms of Enrollment." A student given permission to enroll at Yale for an additional term, if the term represents more than the equivalent of eight terms of enrollment at the college level, is eligible for scholarship assistance from Yale for the additional term.
5. **Transcripts** A transfer student's Yale transcript indicates the institutions from which the student transferred to Yale, the number of course credits earned there, and the titles of courses taken. It does not list the grades earned at the transfer student's previous colleges or universities. A transfer student who needs a record of studies completed before admission to Yale must secure a transcript from the previous institutions.
6. **Course credit from outside Yale** Transfer students may receive up to two course credits for work completed outside Yale after matriculation and may receive credit for a Year or Term Abroad according to the guidelines of section P, Credit from Other Universities, and section L, Special Academic Arrangements, "Year or Term Abroad," provided that they enroll in Yale College for at least four terms, earning by attendance at Yale a minimum of eighteen course credits.
7. **Distributional requirements** Transfer students are not bound by the distributional requirements for the first year, sophomore year, or junior year, but they must fulfill the distributional requirements for the bachelor's degree. Once accepted for admission, transfer students should consult with the director of the transfer program in order to ascertain their status with regard to the distributional requirements. Transfer students who matriculate at Yale with no previous language training must complete three terms of instruction in a single language. This requirement is fulfilled by the completion of courses designated L1, L2, and L3. Transfer students who matriculate at Yale with prior language training or with prior, approved college-level language courses should consult with the director of the transfer program about the language requirement.
8. **Credit/D/Fail** Transfer students have up to four opportunities to convert a course credit to the Credit/D/Fail option.
9. **Attendance at Yale before enrollment** Once a student has been accepted for admission as a transfer student, the student may not attend Yale as an Eli Whitney student or a non-degree student before his or her first term of enrollment at Yale.

N. Eli Whitney Students Program

The Eli Whitney Students program is designed to meet the needs of students who may not be able to attend college full-time by allowing nonresident students to enroll full-time or part-time in Yale College. Students are eligible to enroll in the program if they do not already hold a bachelor's degree and if they have a five-year gap at least in their post-secondary school education or have been out of high school for five or more years by the time of their matriculation at Yale.

The Eli Whitney Students program is for enrollment for the degree of Bachelor of Arts (B.A.) or Bachelor of Science (B.S.) only; students in the program are therefore ineligible for the simultaneous award of the bachelor's and master's degrees. Eli Whitney students are eligible for five-year programs in Yale University that encompass a bachelor's degree and a master's degree earned consecutively.

1. **Academic requirements** The Eli Whitney Students program normally is to be completed in a period not exceeding seven years from initial enrollment. In any calendar year, an Eli Whitney student must have completed three course credits to remain in academic good standing. Eli Whitney students are required to meet all of the academic obligations of any course in which they enroll and all requirements of their degree program.
2. **Academic Warning, and dismissal for academic reasons** Academic Warning is an indication that a student's scholastic record is unsatisfactory. Academic Warning will be automatic for Eli Whitney students who do not complete three course credits in any calendar year, as well as in the following cases: (a) failure in one term to earn at least one course credit; (b) a record that shows two grades of F in one term; (c) in two successive terms, a record that shows a grade of F for any course. A record that shows a grade of F for an Eli Whitney student who is on Academic Warning in that term will result in that student's dismissal for academic reasons.
3. **Degree requirements** To qualify for the bachelor's degree through the Eli Whitney Students program, Eli Whitney students must fulfill all the requirements for the bachelor's degree. They must thus earn a total of the equivalent of at least thirty-six course credits. Eli Whitney students must enroll in Yale College for at least four terms, earning by attendance at Yale, in the Eli Whitney Students program, at least eighteen of the required thirty-six credits. As many as eighteen course credits earned at another college or university or in the Non-degree Students program at Yale may be transferred toward the requirements for the bachelor's degree. Such transfer credit will be awarded for academic courses that were taken at an accredited institution and that were similar in content to Yale courses. Grades of A or B are expected, and no more than one-quarter of courses accepted for transfer toward the requirements for the degree may have grades of C. Eli Whitney students also must complete the requirements of a major program in Yale College and fulfill the distributional requirements for the bachelor's degree. See Majors in Yale College and The Undergraduate Curriculum under Major Programs.
4. **Distributional requirements** Eli Whitney students are not bound by the distributional requirements for the first year, sophomore year, or junior year, but must nonetheless fulfill the distributional requirements for the bachelor's degree. Once accepted for admission, Eli Whitney students should consult with the director

of the Eli Whitney Students program in order to ascertain their status with regard to the distributional requirements. Eli Whitney students who matriculate at Yale with no previous language training must complete three terms of instruction in a single language. This requirement is fulfilled by the completion of courses designated L1, L2, and L3. Eli Whitney students who matriculate at Yale with prior language training or with prior, approved college-level language courses should consult with the director of the Eli Whitney Students program about the language requirement.

5. **Credit/D/Fail** Eli Whitney students have up to four opportunities to convert a course to the Credit/D/Fail option. As many as two credits may be elected under the Credit/D/Fail option in a term. Thus, in an academic year, a student may earn as many as four credits on the Credit/D/Fail option. Because Eli Whitney students are permitted to enroll in as few as three course credits in a calendar year, and thus sometimes enroll in only one course credit in a term, special limits apply. An Eli Whitney student enrolled in four or more course credits in a term may elect up to two course credits that term under the Credit/D/Fail option; an Eli Whitney student enrolled in three or 3.5 course credits in a term may elect up to 1.5 course credits that term under the Credit/D/Fail option; and an Eli Whitney student enrolled in two or 2.5 course credits in a term may elect up to one course credit that term under the Credit/D/Fail option. An Eli Whitney student enrolled in fewer than two course credits in a term may not elect any course credits that term under the Credit/D/Fail option.
6. **Registration and enrollment** Eli Whitney students enroll in courses as described in section E, Course Enrollment, and according to the deadline stipulated in the Yale College Calendar with Pertinent Deadlines. Students are permitted to enroll for a full course load, up to 5.5 course credits each term, with the possibility of a greater term load if appropriate permissions are secured. See section C, Course Credits and Course Loads, "Normal Program of Study." Eli Whitney students are eligible to enroll in Directed Studies or First-Year Seminars only under certain limited conditions. Students should consult with the director of the Eli Whitney Students program in order to ascertain their eligibility.
7. **Tuition and financial aid** Eli Whitney students are not to be charged in excess of the maximum full tuition rate in any given term. Yale employees enrolled in the Eli Whitney Students program are entitled to a tuition reduction as determined by the Office of Human Resources. Tuition must be paid in full to the Office of Student Financial Services before registration. Eli Whitney students are eligible to apply for financial aid. For more information about tuition and financial aid, see Financial Aid for Eli Whitney Students.
8. **Facilities and services** Eli Whitney students are entitled to use the library system together with the other facilities that are required for the courses in which they are enrolled, such as laboratories, computers, and the like. They are also eligible for services through the Office of International and Summer Programs, the Office of Fellowships, and the Office of Career Strategy. Eli Whitney students are entitled to purchase gymnasium memberships and Yale Health coverage. Students in the Eli Whitney program are not eligible for undergraduate housing and they may not serve as first-year counselors.

9. **Regulations** Eli Whitney students are governed by the academic regulations of Yale College, wherever appropriate, and by the rules contained in the Yale online publication Undergraduate Regulations. In disciplinary matters, Eli Whitney students are subject to the jurisdiction of the Yale College Executive Committee.
10. **Leave of absence and withdrawal** See section J, Time Away and Return. All regular deadlines and policies apply.
11. **Transcripts** An Eli Whitney student's Yale transcript indicates the institutions from which the student transferred to Yale, the number of course credits earned there, and the titles of courses taken. It does not list grades earned at the student's previous colleges or universities. An Eli Whitney student who needs a record of studies completed before admission to Yale must secure a transcript from the previous institutions.
12. **Course credit from outside Yale** Students enrolled in the Eli Whitney Students program may receive up to two course credits for work completed outside Yale after matriculation, according to the guidelines of section P, Credit from Other Universities, provided that they enroll in Yale College for at least four terms, earning by attendance at Yale a minimum of eighteen course credits.
13. **Year or Term Abroad** With the approval of the director of the Eli Whitney Students program and the Committee on the Year or Term Abroad, students enrolled in the Eli Whitney Students program may undertake study outside the United States for a year or term abroad. An Eli Whitney student must comply with all deadlines and requirements of the Committee on the Year or Term Abroad. See section L, Special Academic Arrangements, "Year or Term Abroad." To be eligible to apply, an Eli Whitney student must have accumulated, before enrolling abroad, at least twelve course credits but no more than twenty-two course credits toward the 36-course-credit requirement. Study abroad must involve full-time work at the university level. Eli Whitney students must enroll for at least two terms in Yale College after their return from study abroad.
14. **Yale students** No person who was ever a regular student in Yale College may enter the Eli Whitney Students program before the lapse of five years after withdrawing from Yale College. A person who in the past has withdrawn from Yale College without graduating and who wishes to return to Yale as a candidate for the bachelor's degree as an Eli Whitney student must make application to the Eli Whitney Students program and fulfill all of its requirements for the bachelor's degree, including the requirement that at least eighteen course credits must be earned while the student is enrolled in the Eli Whitney Students program. Once a former Yale College student has entered the Eli Whitney Students program, that student may pursue the bachelor's degree only through the Eli Whitney Students program.

Further information and application forms for the Eli Whitney Students program are available from the Undergraduate Admissions Office's Eli Whitney Students program website.

O. Non-degree Students Program

The Non-degree Students program is designed to meet the needs of students with specific and defined educational goals, which may include personal or professional

enrichment, exploration of new fields, or preparation for career changes. Normally, students are admitted for a period of one to two terms; students wishing to extend their enrollment must reapply through the Admissions Office.

The Non-degree Students program offers nonresident students who are unable to attend college full time the opportunity to enroll in Yale College courses for credit. The Non-degree Students program is open to graduates of Yale College, and is also open to academically qualified persons who have attended other colleges and universities or who have not continued their education beyond high school. Like all Yale College students, students in this program are required to comply with the academic regulations. Students not matriculated at Yale but participating in one of Yale's Reserve Officers Training Corps (ROTC) programs under a cross-town arrangement are registered as non-degree students. As such, they are subject to Yale College undergraduate regulations as a condition of their participation in Yale's ROTC program.

Non-degree students may enroll in from one to five course credits in any academic term. Non-degree students may not take more than a total of eighteen course credits in the Non-degree Students program.

1. **Academic requirements** Non-degree students are required to meet all of the academic obligations of any course in which they enroll. At the end of a term, the record of any non-degree student who does not have at least a C average for that term will be reviewed and that student may not be permitted to enroll in a subsequent term. To remain in academic good standing, a student is furthermore expected to complete at least one course per term. Withdrawal from all courses in any given term may jeopardize good standing and enrollment in a subsequent term. Students who plan not to enroll in courses in any given term must apply for a leave of absence on or before the fifteenth day of the term in question. A leave of absence may be granted for no more than two terms. Any student who does not enroll in courses in a term and does not apply for a leave of absence may be removed from the program.
2. **Enrollment and registration** Non-degree enrollment may begin in either the fall or the spring term. All non-degree students register for courses with the Office of Academic Affairs. In general, admission to limited-enrollment courses is not available to non-degree students. Auditing is not permitted in the Non-degree Students program. Non-degree students are not eligible for enrollment in individual tutorial courses; nor are they eligible, while in the Non-degree Students program, for enrollment in courses in the graduate or the professional schools. Those interested in enrolling in such courses should apply directly to the Graduate School of Arts and Sciences or to the particular professional school in whose courses they wish to enroll.
3. **Credit/D/Fail option** Non-degree students who wish to elect a course under the Credit/D/Fail option must make a compelling case for that election in a petition to the Office of Academic and Educational Affairs at least one week prior to the last day of classes in that term. Non-degree students may take no more than one course in a term using the Credit/D/Fail option, and must be enrolled in at least one other course worth a minimum of one course credit during the same term. A maximum of

two courses may be taken Credit/D/Fail during a student's time in the Non-degree Students program.

4. **Tuition** The tuition for non-degree students per course credit can be found on the Admissions, Non-degree Students Program website. Yale employees and their spouses are entitled to a tuition reduction; questions about this employee benefit should be directed to the Office of Human Resources, 203-432-5552. Tuition must be paid in full to the Office of Student Financial Services before registration. Yale provides no financial assistance for non-degree students. Students withdrawing from a course may be eligible for a refund of all or a portion of the tuition fees, in accordance with the tuition refund policy: (1) a student who drops a course for any reason on or before the last day of the add/drop period will be refunded the tuition fees paid for that course; (2) a student who drops a course for any reason after the add/drop period but on or before the day of midterm will be refunded one-half the tuition paid for that course; (3) a student who drops a course after midterm will not be refunded any portion of the tuition. Fees for late submission of course schedules apply as outlined in section E, Course Enrollment. Late tuition payments will be accepted no later than the course schedule deadline date (see the *Yale College Calendar with Pertinent Deadlines*). Any student who has not completed payment in full for courses by this deadline will not be permitted to enroll for that term.
5. **Facilities and services** Non-degree students are entitled to use the library system and other facilities that are required for the courses in which they are enrolled, such as laboratories, computers, and the like. For a fee, they are entitled to purchase gymnasium memberships and Yale Health coverage. Non-degree students are not eligible for undergraduate housing or dining hall meal plans, and they may not serve as first-year counselors.
6. **Regulations** Non-degree students are governed by the academic regulations of Yale College and by the rules contained in the Yale online publication Undergraduate Regulations. In disciplinary matters, non-degree students are subject to the jurisdiction of the Yale College Executive Committee.
7. **Yale students** Students who have withdrawn from Yale College or who did not complete degree requirements within the number of terms of enrollment for which they were admitted may not return to Yale College to complete degree requirements as non-degree students. This rule includes former Yale College students who are currently employees of the University. Students on leave of absence may not be admitted to the Non-degree Students program.
8. **Yale graduates** Graduates of Yale College who have received the bachelor's degree after eight terms of regular enrollment are eligible to apply as non-degree students either on a full-time or on a part-time basis. But Yale College graduates who have taken degrees after fewer than eight terms of regular enrollment are eligible to apply as non-degree students only on a full-time basis until they have completed the equivalent of eight terms of enrollment in Yale College. Thus a student who took a seven-term degree must be a full-time student for the first term in which they are a non-degree student, but may be a part-time non-degree student in a subsequent term. For example, a student who has completed degree requirements at the end of a fall term after eight terms of regular enrollment is eligible to apply as a non-degree student either on a full-time basis or on a part-time basis during the subsequent spring term, but a student who has completed degree requirements at

the end of a fall term after seven terms of regular enrollment is eligible to apply as a non-degree student during the subsequent spring term only on a full-time basis. Please note that any courses taken by a former Yale College student in the Non-degree Students program will appear on the undergraduate transcript.

9. **Transfer students** Students who have been accepted for admission as transfer students may not attend Yale as non-degree students before their first term of enrollment at Yale.
10. **Yale employees** Yale employees require permission of their supervisors to apply.

Further information and application forms are available at the Non-degree Students Program website.

P. Credit from Other Universities

A student may not employ course credits earned at another college or university to reduce the expected number of terms of enrollment in Yale College. Under the conditions described below, a student may apply as many as two course credits earned at another college, university, or academic program toward the 36 course credit requirement for graduation from Yale College. Before undertaking such outside study, the student should consult the residential college dean about both the institution to be attended and the course to be taken there.

1. **Approval of credit** In order for credit to be given for courses taken elsewhere, all of the following conditions must be met:
   a. The Associate Dean of Academic Affairs must approve the award of credit at Yale for the course.
   b. A student who has studied at an American university, or abroad on a program sponsored by an American university, must provide the office of the residential college dean with an official transcript of the work completed. A student who has enrolled in a program that is not sponsored by an American university should supply an official transcript if the sponsoring institution issues transcripts; if it does not, then the student must furnish an official certificate of enrollment, showing if possible the course or courses completed.
   c. Students seeking outside credit should be prepared to furnish a copy of the course syllabus, as well as essays and examinations written in the course. In some cases, a letter from the instructor of the course may be required, or the student may be asked to pass an examination on the material of the course. Such information may be particularly necessary in the case of study at a foreign university.
   d. Study undertaken in the United States must be at a four-year regionally accredited institution that grants a bachelor's degree in the arts and sciences. Extension schools usually do not meet these requirements, and so courses taken at extension schools normally do not qualify for credit. Foreign study must be completed at a university or other approved institution. Credit may be awarded only for work done while a student was officially enrolled at such an institution, and cannot be given for any work completed independently of such formal enrollment.

e. A grade of A or B is expected; a grade of C is acceptable. Credit cannot be given for a mark of Credit on a Credit/D/Fail option, or for a grade of Pass on a Pass/Fail option, if the student had the choice of taking the course for a letter grade.

f. In order for credit to be given for a course completed at another college or university, the course must carry a value of at least three semester credit hours; if the course is taken at an institution on the quarter system, it must carry a value of at least four-and-one-half quarter units.

g. In order for credit to be given for a course completed at another college or university, the course must offer weekly contact with the instructor, and the length of term (from the first to the last day of classes) must be at least four consecutive weeks.

2. **Year or Term Abroad** Yale Study Abroad oversees credit transfer from approved Year or Term Abroad programs. Credits earned on a Year or Term Abroad count toward the 36 course credit graduation requirement and appear on the Yale transcript with the mark TR ("transfer credit"). Grades from a Year or Term Abroad are not listed on the Yale transcript and are not factored into the Yale cumulative GPA. However, students will receive an official transcript from their study abroad program with the grades listed. Yale Study Abroad reviews these grades for transfer credit eligibility. Students are eligible to earn up to 4.5 transfer credits for a term abroad and up to 9 transfer credits for a full year abroad. Students receiving transfer credit may also apply such credit toward the distributional requirements for the bachelor's degree or toward a requirement of the student's major program (see paragraph 7, "Distributional requirements" and paragraph 9, "Major requirements"). For more information, see section K, Special Academic Programs, "Year or Term Abroad."

3. **Non-Yale Summer Abroad** Students who wish to receive credit for summer study abroad with non-Yale programs must meet the eligibility requirements and apply for approval through Yale Study Abroad. As a exception, students may apply more than two credits earned at another institution abroad toward the 36 course credit graduation requirement. Courses in Yale Summer Session Programs Abroad are not considered outside courses, and there is no limit on the number of such courses that a student may offer toward the requirements of the bachelor's degree; see section K, Special Academic Programs, "Courses in Yale Summer Session." Similarly, courses taken in the Yale College program at the Paul Mellon Centre in London are Yale courses and do not count as outside credit. Students should note that the application process for Yale Summer Session Programs Abroad differs and often has an earlier deadline than the Non-Yale Summer Abroad credit application. Information about the application process, including a list of designated programs, is available on the Yale Study Abroad website. Students receiving credit for summer study abroad may also apply such credit toward the distributional requirements for the bachelor's degree or toward a requirement of the student's major program (see paragraph 7, "Distributional requirements" and paragraph 9, "Major requirements").

4. **Residential College Seminars** Residential College Seminars are, by definition, courses that extend beyond the Yale College curriculum. They are not used as comparables for credit for outside courses, whether in Year or Term Abroad or for other considerations for outside credit.

5. **Work done while in secondary school** Course credit or distributional credit cannot be given for any college or university course taken while the student was still enrolled in secondary school. Work done after graduation from secondary school but before matriculation at Yale may be accepted on recommendation from the Director of Academic and Educational Affairs. As a regular exception to this rule, students who earned credits while still enrolled in secondary school as members of the Non-degree Students program in Yale College or as students in Yale Summer Session may apply such credits toward the requirements of the bachelor's degree.
6. **Limit of two course credits** Credit cannot be given for more than two course credits earned at another institution. An exception of one additional course credit may be made only by action of the Committee on Honors and Academic Standing upon the student's petition, normally after the final term of enrollment, or in cases where a student is thereby fulfilling the language requirement in a language not offered at Yale (see paragraph 8, "The language requirement and courses taken elsewhere," below). In no case may a student bring in more than three outside graduation course credits, with the exception of an approved Year or Term Abroad.
7. **Distributional requirements** With permission, course credit earned at another college or university may be applied toward the distributional requirements for the bachelor's degree and to those for the sophomore and junior years whether or not it is counted toward the 36-course-credit requirement for graduation; instructions on applying such credit toward the distributional requirements are available on the Fulfilling Requirements While Away on the Yale Study Abroad website. Credit from outside Yale may not be applied toward the distributional requirements for the first year. Yale also does not award credit toward distributional requirements for courses completed at another college or university before the student graduated from secondary school, nor for online courses completed outside Yale, except in cases where a student is fulfilling the foreign language requirement in a language not offered at Yale (see paragraph 13, "Online courses," below).
8. **The language requirement and courses taken elsewhere** Students who have taken a course in a language at another institution, either in the United States or through a program abroad, and who wish to offer that course toward fulfillment of the language distributional requirement must secure the approval of the relevant director of undergraduate studies. While the approval process varies across departments, in no case can it be completed until an official transcript of the work has been received and reviewed by the department. Typically, an additional assessment of the student's work will be necessary, especially with respect to the level (e.g., L1 through L5) that has been achieved by the outside study. Such assessment might include a written or oral examination or both, a review of the course syllabus and written assignments, or other methods of evaluation. Some departments maintain a list of programs that have been previously evaluated, in which case the approval process is often simplified. Students are therefore strongly encouraged to consult the relevant department before undertaking language study elsewhere. For languages not offered at Yale, students should seek guidance from the Center for Language Study about the possibility of fulfilling the language requirement in that language through outside credit.
9. **Major requirements** At the discretion of the director of undergraduate studies in a student's major, work done at another institution may be counted as fulfilling a

requirement of the student's major program. This may be done whether or not a course is credited toward the 36-course-credit requirement.

10. **Transfer students and Eli Whitney Program students** Transfer students and students in the Eli Whitney Program may receive up to two course credits for work completed outside Yale after matriculation and may receive credit for a Year or Term Abroad according to the guidelines of section M, Transfer Students, section N, Eli Whitney Students Program, and section K, Special Academic Programs, "Year or Term Abroad," provided that they enroll in Yale College for at least four terms, earning by attendance at Yale a minimum of eighteen course credits.
11. **Internships, field studies, and the like** Course credit cannot be given for such programs as internships, field studies, or workshops, but these experiences may be included as a component of a full, regular, academic course of instruction, certified by a transcript from an accredited four-year institution granting a bachelor's degree.
12. **Independent study** Course credit cannot be given for independent study courses taken at another university except for independent study courses taken as part of a designated study abroad program with the approval of Yale Study Abroad.
13. **Online courses** Online courses from other universities may be eligible for Yale credit under limited conditions. The course must include regular interaction with the instructor, as well as regular feedback. For online courses offered during the summer, such courses may not be comparable to a course offered online through Yale Summer Session. Online courses may not be used by students to repair a deficiency for promotion (see section I, Academic Penalties and Restrictions, "Makeup of Course Deficiencies for Promotion or Academic Good Standing"), and may not be applied toward a distributional requirement, with the exception that online courses in a language not offered at Yale may be applied, with the support of the Director of the Center for Language Study, toward the language requirement (see paragraph 8, "The language requirement and courses taken elsewhere," above). Online courses taken by Eli Whitney and transfer students before matriculation at Yale may apply toward their degree.
14. **Yale transcript** Outside courses may be entered on a student's Yale transcript only if they are applied to the 36-course-credit requirement, the distributional requirements, and/or the requirements of a major program. Such courses must be entered on the Yale transcript if they are to be applied toward any of these requirements. Except for transcripts of transfer students and students in the Eli Whitney Students Program —on which see section M, Transfer Students, or section N, Eli Whitney Students Program—courses that are applied toward the 36-course-credit requirement are listed by title with indication of the credit units earned, but without grades. Courses that are applied only toward the distributional requirements are listed without grades and with the designation "for distributional credit only." Courses that are applied only toward the requirements of a major program are listed without grades and with the designation "for credit toward the major only." Once a course has been entered on a student's Yale transcript at the student's request, or as a consequence of reinstatement, the entry may not subsequently be removed at the student's request.
15. **Acceleration** See section Q, Acceleration Policies.

Q. Acceleration Policies

ACCELERATION BY THE EARLY ACCUMULATION OF THIRTY-SIX COURSE CREDITS

A student may accelerate progress toward graduation by accumulating thirty-six course credits in fewer than eight terms of enrollment.

1. **Outside credit** Students may apply up to two outside course credits toward acceleration by the early accumulation of thirty-six course credits.
2. **Year or Term Abroad** Credits earned on an approved Year or Term (Fall or Spring) Abroad count as the equivalent of Yale course credits. A Year Abroad counts as two terms of enrollment, and a Term Abroad counts as one term of enrollment in Yale College. Students must enroll in Yale courses for the final term of enrollment.
3. **Patterns of attendance** While students employing acceleration credits in order to acquire an accelerated degree are required to attend Yale in certain patterns of attendance (see "Acceleration by Use of Acceleration Credits," paragraph 4, below), no particular pattern of attendance is required from a student accelerating by the early accumulation of thirty-six course credits all earned at Yale.
4. **Six or seven terms of enrollment** Either a six-term degree or a seven-term degree may be acquired by the accumulation of thirty-six course credits; graduation after fewer than six terms of enrollment in Yale College by such an early accumulation of course credits is not permitted.
5. **Notification by the student** A student intending to accelerate through the early accumulation of thirty-six course credits must notify the Committee on Honors and Academic Standing of that intention by the last day of the add/drop period in the student's final term of enrollment. Such notification is made by submission of the required form to the office of the residential college dean and must include written certification from the student's director of undergraduate studies (DUS) that the student will have completed all of the requirements of the major program, and from the residential college dean that the student will have fulfilled the distributional requirements by the conclusion of that term. Failure to submit this notification by the above deadline will result in the student being charged a fine of $100.
6. **Deceleration** A student may subsequently decelerate and take an eight-term degree. A reversion to an eight-term degree will not affect a student's academic good standing or eligibility for eight terms of financial aid.

ACCELERATION BY USE OF ACCELERATION CREDITS

For the definition of acceleration credits and the criteria for their award, see the Table of Acceleration Credit. For the sake of equity and fairness, no exceptions can be made to the regulations governing the use of acceleration credits. Inquiries about acceleration may be addressed to the residential college dean or to the University Registrar's Office (registrar@yale.edu), 246 Church Street.

1. **Eligibility** The following charts list the number of total credits needed to accelerate by one or two terms during a given term of enrollment:

Acceleration by One Term	Minimum Total Credits	Minimum Yale Course Credits	Activated Acceleration Credits
In the third term	12	8	4
In the fourth term	16	12	4
In the fifth term	21	17	4
In the sixth term	26	22	4

Acceleration by Two Terms	Minimum Total Credits	Minimum Yale Course Credits	Activated Acceleration Credits
In the third term	17	8	9
In the fourth term	21	12	9
In the fifth term	26	17	9

2. **Application deadline** Application to accelerate is made by submission of the required form to the office of the residential college dean. The deadline for applying for acceleration is the last day of classes in the respective term of enrollment given in the eligibility charts above. As a special exception, a student accelerating by one or two terms who wishes to complete a term of study abroad as early as during the third term of enrollment would have to petition to accelerate before the third term of enrollment. Such a student should consult with the residential college dean. The absolute and final deadline for applying for acceleration by one term is the last day prior to the start of classes in the seventh term of enrollment. The absolute and final deadline for applying for acceleration by two terms is on the last day prior to the start of classes in the sixth term of enrollment.
3. **Course credit requirement for graduation** A student accelerating by two terms must earn at least twenty-seven course credits at Yale, and a student accelerating by one term must earn at least thirty-two course credits at Yale. Therefore, with the exception of credit earned through enrollment in the Year or Term Abroad program, a student accelerating by use of acceleration credits may not apply any credit earned at another college or university toward the 36-course-credit requirement for the bachelor's degree.
4. **Enrollment requirements** A student intending to accelerate by two terms must complete six terms of full-time enrollment in Yale College. Those six terms may be in any pattern of enrollment.

   A student intending to accelerate by one term must complete seven terms of full-time enrollment in Yale College. Those seven terms may be in any pattern of enrollment.

   A student accelerating by two terms may not combine acceleration credits and course credits to graduate in fewer than six terms; six terms of enrollment is the minimum as well as the maximum requirement for acceleration by two terms. Likewise, a student accelerating by one term may not combine acceleration credits and course credits to graduate in fewer than seven terms; seven terms of enrollment is the minimum as well as the maximum requirement for acceleration by one term.
5. **Deceleration** A student accelerating by two terms or one term may subsequently apply to decelerate by submitting the required form to the office of the residential

college dean. A student who is considering whether to decelerate should consult with the residential college dean as soon as possible. A student accelerating by two terms who subsequently decides to accelerate by only one term must meet the requirements for acceleration by one term. A student accelerating by two terms or one term may subsequently decide to decelerate completely and take an eight-term degree. Two-term accelerants who choose to decelerate in their sixth term, thereby requiring a reinstatement of their original class year, will be assessed a fee of $50. Since by definition an eight-term degree is not an accelerated degree, such a student will lose the use of acceleration credits. A reversion to an eight-term degree will not adversely affect a student's academic good standing or eligibility for eight terms of financial aid.

6. **Reacceleration** A student who has declared an intention to decelerate and to relinquish the use of acceleration credits is permitted to accelerate again through the use of acceleration credits as long as the student meets the eligibility requirements and application deadline for one or two terms of acceleration given in paragraphs 1 and 2 above.

GENERAL RULES RELATING TO THE USE OF ACCELERATION CREDITS

1. **Notification** The chief responsibility for ascertaining eligibility and for meeting the deadline to apply for acceleration rests with the students themselves. Students may, however, contact the University Registrar's Office after the beginning of their third term of enrollment to determine how many acceleration credits they have accrued.

   It is not the responsibility of the University Registrar's Office or Yale College to remind students who have declared an intention to accelerate of the rules on the pattern of attendance stipulated for the use of acceleration credits. Students who are accelerating are themselves responsible for planning to meet these rules, and if a student's pattern of attendance does not conform to them, it will be concluded that the student has decided to relinquish the use of acceleration credits and not to accelerate. Such a student will be automatically decelerated.

2. **Interruption of studies by leave or withdrawal** Terms of enrollment need not be consecutive. A student accelerating by one or two terms has the same privileges of leave of absence or withdrawal that a nonaccelerating student has.
   a. **A fifth term of leave of absence** A student taking an accelerated degree by use of acceleration credits who has had four terms of leave of absence may receive a fifth term of leave if it is needed to bring the student's pattern of attendance into conformity with the pattern of attendance stipulated for an accelerated degree. See section J, Time Away and Return.
3. **Withdrawal** If a student withdraws from a term after the fifteenth day of the term, the uncompleted term counts as a term of enrollment, both in the determination of the student's eligibility to accelerate and in the calculation of the number of terms in which the student has been in attendance at Yale. As an exception to this rule, if an accelerating student withdraws from Yale College without having successfully completed a term, the student has the option of not counting the uncompleted term as one of the six or seven terms of enrollment.
4. **Enrollment in Yale Summer Session or the Yale in London summer program** Attendance at Yale Summer Session or the summer program at the Paul Mellon

Centre in London does not constitute a term of enrollment. Thus a student accelerating by one term may not offer attendance at Yale Summer Session or the summer program at the Paul Mellon Centre in London as one of the required seven terms of enrollment in Yale College. Course credits earned by attendance at these summer programs, however, may be applied toward the requirements for the bachelor's degree by accelerating students, provided that such students meet the conditions specified for acceleration by one or two terms. See also section K, Special Academic Programs, "Courses in Yale Summer Session" and "Yale in London Summer Program."

5. **Course credit from outside Yale** A student accelerating by two terms must earn at least twenty-seven course credits at Yale, and a student accelerating by one term must earn at least thirty-two course credits at Yale. Therefore, an accelerating student may not apply any credit earned at another college or university, other than those earned on a Year or Term Abroad as described in no. 6, below, toward the 36-course-credit requirement for the bachelor's degree. A student, whether accelerating or not, may be permitted to apply course credits earned at another college or university toward the requirements of the student's major program or toward any of the distributional requirements other than those for the first year. See section P, Credit from Other Universities.

   Please note that attendance at the Yale College program at the Paul Mellon Centre in London during the spring term counts just as if it were a term of enrollment at Yale College in New Haven. Attendance at the Paul Mellon Centre during the summer, however, does not count as a term of enrollment. See section K, Special Academic Programs, "Yale in London Summer Program."

6. **Year or Term Abroad** A Year Abroad counts as two terms and a Term Abroad counts as one term of enrollment in Yale College. Credits earned on a Year or Term Abroad count as the equivalent of Yale course credits.

   Note that after a Year or Term Abroad all students must attend at least one term of enrollment in Yale College; see section K, Special Academic Programs, "Year or Term Abroad." In many cases, a student must relinquish the use of acceleration credits and decelerate in order to take a Year or Term Abroad. As a special exception, a student accelerating by one or two terms who wishes to complete a term of study abroad as early as during the third term of enrollment would have to petition to accelerate before the third term of enrollment. A student who wishes to accelerate and to take a Year or Term Abroad should consult with the residential college dean and the Office of International and Summer Programs (OISP) at the earliest opportunity.

An accelerating student who wishes also to complete a Year or Term Abroad must conform to one of the following schemes:

Terms of Acceleration	Total Terms at Yale	Total Terms on YA/TA	Acceleration Credits	Minimum Course Credits Earned at Yale	Maximum Course Credits Earned on YA/TA
1	6	1	4	28	4
1	5	2	4	23	9
2	5	1	9	23	4
2	4	2	9	18	9

8. **Distributional requirements** Acceleration credits may not be employed to meet the distributional requirements for the first, sophomore, or junior years, or the distributional requirements for the bachelor's degree, including the language requirement. With permission, an accelerating student may apply course credit earned at another college or university toward the distributional requirements for the bachelor's degree and to those for the sophomore and junior years; students should consult with the residential college dean to be directed to the appropriate authority for such approval.
9. **Major requirements** With the permission of the DUS, an accelerating student may apply credit earned at another university toward the requirements of the student's major program.
10. **Makeup of course credit deficiency** If an accelerating student's record at the end of a term of enrollment shows a deficiency for promotion, academic good standing, or graduation, the student will be allowed to repair the deficiency without forfeiting the use of acceleration credits only through enrollment in Yale Summer Session if the credit earned is to be applied toward the 36-course-credit requirement for the bachelor's degree. See section D, Promotion and Good Standing.
11. **Enrollment after graduation as a non-degree student** Accelerating students who have qualified for the award of the bachelor's degree are eligible, as are all Yale College graduates, for full-time enrollment in Yale College as non-degree students. Because such students will have graduated, they will not be eligible for financial aid. See section O, Non-degree Students Program.
12. **Transfer students and students in the Eli Whitney Students Program** Students admitted by transfer from other colleges and universities are not eligible for acceleration by the use of acceleration credits.

R. Amendments

The University reserves the right to amend or supplement these regulations at any time upon such notice to students as it deems appropriate.

MAJORS IN YALE COLLEGE

African American Studies (B.A.)
African Studies (B.A.)
American Studies (B.A.)
Anthropology (B.A.)
Applied Mathematics (B.A. or B.S.)
Applied Physics (B.S.)
Archaeological Studies (B.A.)
Architecture (B.A.)
Art (B.A.)
Astronomy (B.A.)
Astrophysics (B.S.)
Biomedical Engineering (B.S.)
Chemical Engineering (B.S.)
Chemistry (B.A. or B.S.)
Classical Civilization (B.A.)
Classics (B.A.)
Cognitive Science (B.A. or B.S.)
Comparative Literature (B.A.)
Computer Science (B.A. or B.S.)
Computer Science and Economics (B.S.)
Computer Science and Mathematics (B.S.)
Computer Science and Psychology (B.A.)
Computing and Linguistics (B.A. or B.S.)
Computing and the Arts (B.A.)
Earth and Planetary Sciences (B.A. or B.S.)
East Asian Languages and Literatures (B.A.)
East Asian Studies (B.A.)
Ecology and Evolutionary Biology (B.A. or B.S.)
Economics (B.A.)
Economics and Mathematics (B.A.)
Electrical Engineering (B.S.)
Electrical Engineering and Computer Science (B.S.)
Engineering Sciences (Chemical) (B.S.)
Engineering Sciences (Electrical) (B.A. or B.S.)
Engineering Sciences (Environmental) (B.A.)
Engineering Sciences (Mechanical) (B.A. or B.S.)
English (B.A.)
Environmental Engineering (B.S.)
Environmental Studies (B.A. or B.S.)
Ethics, Politics, and Economics (B.A.)
Ethnicity, Race, and Migration (B.A.)
Film and Media Studies (B.A.)
French (B.A.)
German Studies (B.A.)
Global Affairs (B.A.)
Greek, Ancient and Modern (B.A.)
History (B.A.)
History of Art (B.A.)
History of Science, Medicine, and Public Health (B.A.)
Humanities (B.A.)
Italian Studies (B.A.)
Jewish Studies (B.A.)
Latin American Studies (B.A.)
Linguistics (B.A.)
Mathematics (B.A. or B.S.)
Mathematics and Philosophy (B.A.)
Mathematics and Physics (B.S.)
Mechanical Engineering (B.S.)
Modern Middle East Studies (B.A.)
Molecular Biophysics and Biochemistry (B.A. or B.S.)
Molecular, Cellular, and Developmental Biology (B.A. or B.S.)
Music (B.A.)
Near Eastern Languages and Civilizations (B.A.)
Neuroscience (B.A. or B.S.)
Philosophy (B.A.)
Physics (B.S.)
Physics and Geosciences (B.S.)
Physics and Philosophy (B.A. or B.S.)
Political Science (B.A.)
Portuguese (B.A.)
Psychology (B.A. or B.S.)
Religious Studies (B.A.)
Russian (B.A.)
Russian, East European, and Eurasian Studies (B.A.)
Sociology (B.A.)
South Asian Studies (second major only)
Spanish (B.A.)

Special Divisional Major (B.A. or B.S.)
Statistics and Data Science (B.A. or B.S.)
Theater, Dance, and Performance Studies (B.A.)
Urban Studies (B.A.)
Women's, Gender, and Sexuality Studies (B.A.)

MAJORS BY DISCIPLINES

HUMANITIES & THE ARTS

- Architecture
- Art
- Classics & Classical Civilization
- Comparative Literature
- East Asian Languages and Literatures
- English
- Film and Media Studies
- History
- History of Art
- History of Science, Medicine, and Public Health
- Humanities
- Jewish Studies
- Languages, including, but not limited to: French, German, Italian, Portuguese, Russian, Spanish
- Music
- Near Eastern Languages and Civilizations
- Philosophy
- Religious Studies
- Theater, Dance, and Performance Studies

SOCIAL SCIENCES

- Anthropology
- Cognitive Science
- Economics
- Global Affairs
- Linguistics
- Political Science
- Psychology
- Sociology

BIOLOGICAL SCIENCES

- Ecology and Evolutionary Biology
- Molecular Biophysics and Biochemistry
- Molecular, Cellular, and Developmental Biology

PHYSICAL SCIENCES

- Astronomy & Astrophysics
- Chemistry
- Earth and Planetary Sciences
- Mathematics

- Neuroscience
- Physics
- Statistics and Data Science

ENGINEERING

- Applied Mathematics
- Applied Physics
- Biomedical Engineering
- Chemical Engineering
- Computer Science
- Electrical Engineering
- Environmental Engineering
- Mechanical Engineering

INTERDISCIPLINARY

- African American Studies
- African Studies
- American Studies
- Archaeological Studies
- Computing and Linguistics
- Computing and the Arts
- East Asian Studies
- Environmental Studies
- Ethics, Politics, and Economics
- Ethnicity, Race, and Migration
- Latin American Studies
- Modern Middle East Studies
- Russian, East European, and Eurasian Studies
- South Asian Studies
- Urban Studies
- Women's, Gender, and Sexuality Studies

CERTIFICATES IN YALE COLLEGE

Students interested in earning certificate(s) should refer to the academic policy about Curricular Combinations and Course Overlap Allowances. Students must declare their intent to earn a certificate by the last day of add/drop period in their final term of enrollment. This is done on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub. Once declared, Degree Audit will track students' progress toward completion of the certificate.

ADVANCED LANGUAGE CERTIFICATES

Ancient Egyptian (See under Near Eastern Languages and Civilizations)
Ancient Greek (See under Classics)
Arabic (See under Near Eastern Languages and Civilizations)
Chinese (See under East Asian Languages and Literatures)
French
German
Hebrew (See under Near Eastern Languages and Civilizations)
Hindi (See under South Asian Studies)
Indonesian (See under Southeast Asia Studies)
isiZulu (See under African Studies)
Italian
Japanese (See under East Asian Languages and Literatures)
Kiswahili (See under African Studies)
Korean (See under East Asian Languages and Literatures)
Latin (See under Classics)
Portuguese
Russian
Sanskrit (See under South Asian Studies)
Spanish
Turkish (See under Near Eastern Languages and Civilizations)
Vietnamese (See under Southeast Asia Studies)
Yoruba (See under African Studies)

INTERDISCIPLINARY CERTIFICATES

Climate Science and Solutions
Education Studies
Education Studies Scholars Intensive (requires an application)
Energy Studies
Food, Agriculture, and Climate Change
Global Health Studies (requires an application)
Human Rights Studies
Human Rights Studies Intensive (requires an application)
Islamic Studies
Medieval Studies
Persian and Iranian Studies
Translation Studies

SKILLS-BASED CERTIFICATES

Collections: Objects, Research, Society
Data Science (See under Statistics & Data Science)
Ethnography
Programming (See under Computer Science)
Quantum Science and Engineering

MAJOR ROADMAPS

Yale College offers over 80 majors, and it may be hard to choose among them. As you contemplate the choices, and even after you have chosen, it may be difficult to determine precisely which courses you need to take and when to take them to fulfill the requirements of the major.

Find roadmaps for the majors listed below in the Roadmap Library.

- African American Studies
- African Studies
- American Studies
- Anthropology
- Applied Mathematics
- Biomedical Engineering
- Chemistry
- Cognitive Science
- Comparative Literature
- Computer Science
- Computer Science and Mathematics
- East Asian Studies
- Ecology and Evolutionary Biology
- Economics
- Economics and Mathematics
- English
- Environmental Studies
- Ethics, Politics, and Economics
- Ethnicity, Race, and Migration
- Film and Media Studies
- French
- German Studies
- Global Affairs
- History
- History of Art
- History of Science, Medicine, and Public Health
- Humanities
- Italian Studies
- Linguistics
- Mathematics
- Mechanical Engineering
- Molecular Biophysics and Biochemistry
- Molecular, Cellular, and Developmental Biology

- Neuroscience
- Philosophy
- Physics
- Political Science
- Psychology
- Russian
- Russian, East European, and Eurasian Studies
- Sociology
- Spanish
- Statistics and Data Science
- Theater, Dance, and Performance Studies
- Women's, Gender, and Sexuality Studies

YALE COLLEGE & DEPARTMENTAL ATTRIBUTES

Attributes are searchable labels that have been added to a course.

- *Course attributes are used by Yale College* to indicate courses that earn specific distributional requirements.
- *Course attributes are used by departments to* indicate courses that count toward major requirements.
- *Course attributes are used by Degree Audit to* track fulfillment of major, concentration, and certificate requirements.
- *Course attributes are used by Certificates to* label courses that count toward specific certificate requirements.
- *Course attributes are used by students to* find courses that fulfill major, concentration, and certificate requirements. This is done in Yale Course Search by using the Search dropdown option called *Any Course Information Attribute*. Students may also search for distributional designations assigned to a course by using the *Yale College Attributes* dropdown option.

YALE COLLEGE DISTRIBUTION DESIGNATION ATTRIBUTES

- Humanities (HU)
- Language, Level 5 (L5)
- Quantitative Reasoning (QR)
- Science (SC)
- Social Sciences (SO)
- Writing (WR)
- Writing in a Discipline (WD)
- First-Year Seminar
- Sophomore Seminar

DEPARTMENTAL ATTRIBUTES

American Studies (AMST)

- YC AMST Cultural Hist/Studies
- YC AMST Early Americas
- YC AMST First-Year Sem
- YC AMST Gateway Courses
- YC AMST Junior Seminars
- YC AMST Senior Seminars
- YC AMST Special&Sr Projects
- YC AMST Survey of Am Lit

Anthropology (ANTH)

- YC ANTH Adv Lab/Data Analysis
- YC ANTH Archaeology
- YC ANTH Biological
- YC ANTH Linguistic
- YC ANTH Medical
- YC ANTH Sociocultural
- YC ANTH Theory

Archaeological Studies (ARCG)

- YC ARCG Advanced Lab
- YC ARCG Intro Survey
- YC ARCG Theory

Architecture (ARCH)

- YC ARCH History & Theory
- YC ARCH Materials & Design
- YC ARCH Structures & Computation
- YC ARCH Urbanism & Landscape

Biomedical Engineering (BENG)

- YC BENG Bioimaging
- YC BENG Biomchncs&Mchnbiology
- YC BENG Biomolecular Engrng
- YC BENG Systems Biology

Chemistry (CHEM)

- YC CHEM Advanced Courses
- YC CHEM GR of Interest to UG
- YC CHEM Intermediate Courses
- YC CHEM Introductory Courses
- YC CHEM Nonmajor w/o Prereq

Classics (CLSS)

- YC CLSS Ancient Hist Rome
- YC CLSS Ancient Hist Greece
- YC CLSS Lit/Cult Anc Greece
- YC CLSS Lit/Cult Anc Rome
- YC CLSS Hist, Phil, Art, Arcg

Climate Science and Solutions Certificate

- YC Climate Anthropogenic
- YC Climate Basic Climate Sci
- YC Climate Non-science

- YC Climate Sci/Eng/Tech
- YC Climate Sci/Solutions Sem
- YC Climate Solutions

Cognitive Science (CGSC)

- YC CGSC Skills

Collections: Objects, Research, Society Certificate

- YC Collections Research
- YC Collections Society
- YC Collections Engagement

Comparative Literature (CPLT)

- YC CPLT 17th-18th centuries
- YC CPLT 19th Century
- YC CPLT 20th & 21st Centuries
- YC CPLT Antiquity
- YC CPLT Early Modern
- YC CPLT Film
- YC CPLT Medieval
- YC CPLT Modern (1800-present)
- YC CPLT Theory
- YC CPLT Translation Studies

Computer Science (CPSC)

- YC CPSC Elective

Computer Science and Economics (CSEC)

- YC CSEC Elective not CS or EC
- YC CSEC Electv intrsctn CS/EC

Computer Science and Math

- YC CPSC&MATH Adv CS Elective

Computing and the Arts (CPAR)

- YC CPAR ARCH CS Elective
- YC CPAR ART CS Elective
- YC CPAR HSAR CS Elective
- YC CPAR MUSI CS Elective
- YC CPAR THST CS Elective
- YC CPAR MUSI Addl Course

Computing and Linguistics (CPLI)

- YC CPLI Elective in CP & Ling

Ecology and Evolutionary Biology (EEB)

- YC E&EB BS Elective
- YC E&EB Intermediate/Advanced
- YC E&EB Introductory Courses
- YC E&EB Organismal Lec/Labs
- YC E&EB Prereq Option
- YC E&EB Biodiversity Elective
- YC E&EB Organismal Elective

Economics (ECON)

- YC ECON Core
- YC ECON Development
- YC ECON EconData
- YC ECON Education
- YC ECON Environment
- YC ECON Finance
- YC ECON Health
- YC ECON History
- YC ECON Industrial Orgnztion
- YC ECON International
- YC ECON Introductory
- YC ECON Labor
- YC ECON Law
- YC ECON Macroeconomics
- YC ECON Methodology
- YC ECON Microtheory
- YC ECON Neuro
- YC ECON Political Economy
- YC ECON Poverty
- YC ECON Public
- YC ECON Theory Seminar

Education Studies Certificate (EDST)

- YC EDST Social Context
- YC EDST Individuals in Society
- YC EDST Theory & Research
- YC EDST Policy
- YC EDST Pedagogy

Energy Studies Certificate (ENRG)

- YC ENRG Energy & Environment
- YC ENRG Energy & Soc
- YC ENRG Energy Science & Tech

English (ENGL)

- YC ENGL 18th/19th Century
- YC ENGL 20th/21st Century
- YC ENGL Creative Writing
- YC ENGL Junior Seminar
- YC ENGL Medieval
- YC ENGL Renaissance
- YC ENGL Senior Seminar
- YC ENGL Pre-1800 Lit
- YC ENGL Pre-1900 Lit
- YC ENGL American Lit

Environmental Studies (EVST)

- YC EVST Core Human/Social Sci
- YC EVST Core BA Natural Scie
- YC EVST BS Natural Sci Lab
- YC EVST Advanced Seminar
- YC EVST Core BS Natural Sci

Ethics, Politics, and Economics (EP&E)

- YC EP&E Advanced Seminar
- YC EP&E Economics Core
- YC EP&E Ethics Core
- YC EP&E Intro Econometrics
- YC EP&E Intro Ethics
- YC EP&E Intro Game Theory
- YC EP&E Intro Microeconomics
- YC EP&E Intro Political Phil
- YC EP&E Intro Statistics
- YC EP&E Politics Core

Ethnicity, Race & Migration (ER&M)

- YC ER&M Elec Within the Major
- YC ER&M Methods Course
- YC ER&M Required Courses
- YC ER&M Research & Sr Essay

Ethnography Certificate

- YC Ethnography Elective
- YC Ethnography Methods

Film and Media Studies (FILM)

- YC FILM Critical Studies
- YC FILM World Cinema
- YC FILM Production

Food, Agriculture, and Climate Change Certificate

- YC Food Consumption
- YC Food Environment
- YC Food Production

French (FREN)

- YC FREN Pre-1800
- YC FREN Taught in English
- YC FREN Taught in French

German (GMAN)

- YC GMAN Aesthetics & Arts
- YC GMAN Critical Thought
- YC GMAN History & Politics
- YC GMAN Literature
- YC GMAN Media & Media Theory

Global Affairs (GLBL)

- YC GLBL Elective
- YC GLBL 121 Alternative Course
- YC GLBL Addtl Methods Course
- YC GLBL Qualitative Methods
- YC GLBL History

Global Health Studies Certificate

- YC Glbl Hlth Bio & Env Infl
- YC Glbl Hlth Health & Soc
- YC Glbl Hlth Hist Approaches
- YC Glbl Hlth Perf Rep & Hlth
- YC Glbl Hlth Polit Econ & Gov
- YC Glbl Hlth Quantitative Data

History (HIST)

- YC HIST Africa
- YC HIST Asia
- YC HIST Cultural History

- YC HIST Departmental Seminars
- YC HIST Empires & Colonialism
- YC HIST Environmental History
- YC HIST Europe
- YC HIST First-Year Seminars
- YC HIST Ideas & Intellectuals
- YC HIST Intl & Diplomat Hist
- YC HIST Latin America
- YC HIST Lecture Courses
- YC HIST Middle East
- YC HIST Pltcs, Law & Govt
- YC HIST Preindustrial
- YC HIST Race Gender&Sexuality
- YC HIST Religion in Context
- YC HIST Sci, Tech, & Medicine
- YC HIST Senior Essay
- YC HIST Soc Chng&Social Mvmnt
- YC HIST The World Economy
- YC HIST United States
- YC HIST War & Society
- YC HIST World

History of Art (HSAR)

- YC HSAR 1500-1800
- YC HSAR 800-1500
- YC HSAR Africa & Pacific
- YC HSAR Asia & Near East
- YC HSAR Europe
- YC HSAR Post-1800
- YC HSAR Pre-800
- YC HSAR The Americas
- YC HSAR Transchronological
- YC HSAR Transregional

History of Science, Medicine and Public Health (HSHM)

- YC HSHM Colonial Know & Power
- YC HSHM Environ & Society
- YC HSHM Gender, Reprod & Body
- YC HSHM Med & Public Health
- YC HSHM Media Info & Public

- YC HSHM Minds and Brains
- YC HSHM Sci, Tech & Society

Human Rights Studies Certificate

- YC Human Rights Domestic
- YC Human Rights International

Humanities (HUMS)

- YC HUMS CoreSem Interpretations
- YC HUMS CoreSem Modernities
- YC HUMS CoreSem Traditions
- YC HUMS Area Arts
- YC HUMS Area History
- YC HUMS Area Literature
- YC HUMS Area Science
- YC HUMS Foundtns Any Tradition
- YC HUMS Foundtns WesternEurope

Islamic Studies Certificate

- YC Islamic Stud Art Arch Lit
- YC Islamic Stud History
- YC Islamic Stud Religion
- YC Islamic Stud Society

Italian (ITAL)

- YC ITAL Taught in English
- YC ITAL Taught in Italian

Linguistics (LING)

- YC LING American Sign Courses
- YC LING Adv Courses/Seminars
- YC LING Breadth
- YC LING Depth
- YC LING Depth Comp Linguistic
- YC LING Depth Historical Ling
- YC LING Depth Lang&Mind/Brain
- YC LING Depth Morphology
- YC LING Brdth Phonetics
- YC LING Brdth Morphology
- YC LING Brdth Semntcs/Pragmat
- YC LING Brdth Comp Ling
- YC LING Brdth Lang&Mind/Brain
- YC LING Brdth Historical Ling

- YC LING Depth Phonetics
- YC LING Depth Phonology
- YC LING Depth Semntcs/Pragmat
- YC LING Depth Syntax
- YC LING Elective
- YC LING Intermediate Courses
- YC LING Introductory Courses
- YC LING Res Courses/Sr Essay

Mathematics (MATH)

- YC MATH Algebra/Number Theory
- YC MATH Analysis
- YC MATH Core Algebra
- YC MATH Core Complex Analysis
- YC MATH Core Real Analysis
- YC MATH Distribution
- YC MATH Geometry/Topology
- YC MATH Logic/Foundations
- YC MATH Stat/Applied Math
- YC MATH&PHIL Logic Component

Mechanical Engineering (MENG)

- YC MENG BS Technical Elective
- YC MENG Eng Sci-Mech Crse

Medieval Studies Certificate (MDVL)

- YC MDVL East & SE Asia
- YC MDVL Eur Russ & N Atlantic
- YC MDVL Nr East & N Africa
- YC MDVL S & Central Asia

Modern Middle East Studies (MMES)

- YC MMES Adv Seminar
- YC MMES Distribution Course
- YC MMES Survey Course

Music (MUSI)

- YC MUSI Advanced Grp I
- YC MUSI Advanced Grp II
- YC MUSI Advanced Grp III
- YC MUSI Advanced Grp IV
- YC MUSI Intermediate Grp I
- YC MUSI Intermediate Grp II

- YC MUSI Intermediate Grp III
- YC MUSI Intermediate Grp IV

Near Eastern Languages and Civilizations (NELC)

- YC NELC Foundations Course

Neuroscience (NSCI)

- YC NSCI Basic Allied Core
- YC NSCI Computational
- YC NSCI Molecular/Cell/Biol
- YC NSCI Neuroscience Lab
- YC NSCI Other Allied
- YC NSCI Quantitative
- YC NSCI Statistics Prereq
- YC NSCI Systems/Circuit/Behav
- YC NSCI RC

Persian & Iranian Studies Certificate

- YC Persia & Iran Content

Philosophy (PHIL)

- YC PHIL Ethics & Value Theory
- YC PHIL History of Philosophy
- YC PHIL Intersctn PSYC/PHIL
- YC PHIL Logic
- YC PHIL Metaphysics&Epistemol

Political Science (PLSC)

- YC PLSC American Govt
- YC PLSC Analyt Pol Theory
- YC PLSC Comparative Govt
- YC PLSC Internatl Relations
- YC PLSC Intro Courses
- YC PLSC Method &Formal Theory
- YC PLSC Political Philosophy

Programming Certificate

- YC Prog Advanced Programming
- YC Prog Applctions/Algorithms
- YC Prog Data Structures
- YC Prog Programming
- YC Prog Programming Elective

Psychology (PSYC)

- YC PSYC Natural Science
- YC PSYC Natural Science Core
- YC PSYC NSCI Track Adv Scie
- YC PSYC NSCI Track RsrchMthds
- YC PSYC NSCI Track Senior Sem
- YC PSYC Social Science
- YC PSYC Social Science Core

Quantum Physics Certificate

- YC Quantum Elective

Sociology (SOCY)

- YC SOCY Economy & Sociology
- YC SOCY Health & Society
- YC SOCY InequalityRaceSociety
- YC SOCY Sociological Methods

South Asian Studies (SAST)

- YC SAST Premodern South Asia

Spanish (SPAN)

- YC SPAN Taught in Spanish

Statistics & Data Science (S&DS)

- YC S&DS DataAnalyDiscArea
- YC S&DS Methods Data Science

Theater, Dance, and Performance Studies (TDPS)

- YC TDPS Artistic Practice
- YC TDPS Elective
- YC TDPS Histories
- YC TDPS Interarts
- YC TDPS Performance Theory

Urban Studies (URBN)

- YC URBN Elective
- YC URBN Methods Course
- YC URBN Survey Course
- YC URBN Urban Lab

III. SUBJECTS OF INSTRUCTION

Accounting

Please see Yale Course Search for information about ACCT 2700, Foundations of Accounting and Valuation.

Aerospace Studies

Program advisers: Lester Oberg (lester.oberg@yale.edu) and Nathan Luchini (nathan.luchini@yale.edu); airforce@yale.edu; afrotc.yalecollege.yale.edu

Aerospace Studies is the academic component of the Yale Air Force Reserve Officer Training Corps (AFROTC) Detachment 009. Typically, students pursue the Aerospace Studies curriculum in tandem with AFROTC program requirements, including military leadership preparation and physical training. After completing all Air Force ROTC requirements and Yale College academic degree requirements, cadets commission as officers into the Air Force or Space Force upon graduation from Yale College, serving in a variety of military specialties such as aviation, intelligence, logistics, and medicine. The Aerospace Studies program and the AFROTC prepare students to excel as Air Force and Space Force leaders and to operate effectively in a dynamic military environment.

For additional information about Yale's Air Force Reserve Officers Training Corps program, visit the program website.

COURSES FOR NONMAJORS

Enrollment in Aerospace Studies courses is not limited to cadets; courses are open to any Yale student.

ACADEMIC REQUIREMENTS

The Aerospace Studies core curriculum introduces topics such as the profession of arms, military history, military communication, national security, and the philosophy of warfare. The Department of Aerospace Studies presents this content in the context of military leadership to prepare students for active duty service. Most Aerospace Studies courses count for enrollment credit only; they do not count toward the thirty-six course credits required for the Yale bachelor's degree. USAF 2014, USAF 4011, and USAF 4014 do count toward graduation credit.

Students in the AFROTC program must successfully complete eight USAF courses total, typically taking one course per semester, in addition to the requirements of their Yale College major. The Department of Aerospace Studies offers these courses: USAF 1001, 1002, 2001, 2002, 3001, 3002, 4001, 4002, 4011, and 4014. When the Department of History offers HIST 1221, Military History of the West since 1500, cadets may use it to fulfill the one term of the 2000-level AFROTC requirement (USAF 2002) and also count it toward the bachelor's degree. Cadets become involved in the management of their own cadet wing through a mandatory two-hour leadership laboratory each week.

Credit/D/Fail No course taken Credit/D/Fail may be counted toward the program in Aerospace Studies.

FACULTY ASSOCIATED WITH THE PROGRAM OF AEROSPACE STUDIES

Lecturers Colonel Lester Oberg, USAF, Major Nathan Luchini, USAF

ROTC Training Instructor Technical Sergeant Christopher Goad, USAF

African American Studies

Director of undergraduate studies: Elizabeth Hinton (elizabeth.hinton@yale.edu); afamstudies.yale.edu

The African American Studies major examines, from numerous disciplinary perspectives, questions of race, culture, and modern struggles for equality centering on the experiences of people of African descent in Black Atlantic societies including the United States, the Caribbean, Latin America, Europe, and Africa, and the global impact of those experiences. Students in the department explore the historical, cultural, political, economic, and social development of Black Atlantic societies. Majors work to become informed thinkers who are intellectually prepared to offer clarity and insight to ongoing academic and public debates centered in questions concerning race and inequality.

African American Studies majors become knowledgeable about the history, primary methodologies, and interdisciplinary breadth of the field. Students learn to critique, articulate, analyze, and interpret universal themes concerning both individuals in society and group interactions as they relate to the work of scholars, scientists, writers, artists, musicians, economists, and entrepreneurs.

REQUIREMENTS OF THE MAJOR

African American Studies can be taken either as a stand-alone major or as one of two majors in consultation with the director of undergraduate studies (DUS). Pertinent regulations can be found in Academic Regulations, section L, Special Academic Arrangements, "Two Majors."

The major in African American Studies requires twelve term courses, including seven core courses and five electives in a focus area. The seven core courses include the African American history sequence AFAM 1160 and AFAM 1162, which can be taken in either order; one humanities course in African American literature; one course in the social sciences relevant to African American studies; the junior seminar (AFAM 4310); the senior colloquium (AFAM 4380) and senior essay (AFAM 4391).

Area of focus Students majoring in African American Studies are required to choose an area of focus comprised of five courses. This cluster of interrelated courses is intended to ground the student's learning experience in one area of investigation. Often students choose an area of focus in a traditional discipline such as political science, art history, economics, sociology, American studies, history, or English language and literature. Students can also construct interdisciplinary areas of focus that span traditional departments and encompass broader theoretical frameworks such as race and ethnicity, cultural studies, black arts, or feminism and gender studies. All majors are encouraged to take upper-level courses as part of their focus, especially those courses centering on research and methodology. None of the seven core courses may be counted among the required electives in the area of focus.

Junior seminar In their junior year students must take the junior seminar, AFAM 4310. This course provides majors with theoretical and methodological bases for the work they will do during their research-oriented senior year.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Senior majors participate in a colloquium in AFAM 4380 that provides them an opportunity to exchange ideas with each other and with more advanced scholars. Students in AFAM 4380 submit a prospectus, compile a working bibliography, begin or continue research, and write the first twenty pages of the senior essay. After completing the colloquium, each student carries out the remaining research and writing of a senior essay in AFAM 4391 under the guidance of a faculty member in the chosen discipline or area of focus.

Students are strongly encouraged to use the summer between the junior and senior years for research directly related to the senior essay. For example, field or documentary research might be undertaken in urban or rural communities in America and throughout the diaspora. The particular research topic and design are to be worked out in each case with a faculty adviser.

ADVISING

Students considering a program of study in African American Studies should consult the DUS as early as possible. Areas of focus and schedules for majors must be approved by the DUS.

Two majors The requirements for double majoring often depend on the other department or discipline in which the student is planning to major. Students interested in double majoring should initially make an appointment with the DUS in African American Studies to discuss their plans and the courses they have already taken toward the African American Studies major. The student should, then, plan a meeting with both the DUS in African American Studies as well as the DUS in the other department to ensure clarity on the requirements for both departments. During this meeting, the student may explore the possibility of writing a joint thesis instead of two separate theses.

Graduate work African American Studies offers training of special interest to those considering admission to graduate or professional schools and careers in education, journalism, law, the arts, business management, city planning, international relations, politics, psychology, publishing, public health, or social work. The interdisciplinary structure of the department offers students an opportunity to satisfy the increasingly rigorous expectations of admissions committees and prospective employers.

STUDY ABROAD

A limited number of courses taken during sophomore or junior semesters abroad can be counted toward the major with DUS approval.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses, incl 7 core courses (incl sen req), and 5 electives in a focus area

Specific courses required AFAM 1160, 1162, 4310

Distribution of courses 1 humanities course in AFAM lit and 1 relevant social science course, both approved by DUS; 5 courses in focus area

Senior requirement Senior colloquium (AFAM 4380) and senior essay (AFAM 4391)

FACULTY OF THE DEPARTMENT OF AFRICAN AMERICAN STUDIES

Professors Elijah Anderson, David Blight, Daphne Brooks, Hazel Carby (*Emeritus*), Marlene Daut, Erica Edwards, Roderick Ferguson, Kaiama Glover, Phillip Atiba Solomon, Jacqueline Goldsby, Elizabeth Hinton, Matthew Jacobson, Gerald Jaynes, Tavia Nyong'o, Edward Rugemer, Robert Stepto (*Emeritus*), Michael Veal, Shane Vogel

Associate Professor Crystal Feimster

Assistant Professors Na Na Adusei-Poku**,** Allison Harris, Jonathan Howard, Elleza Kelley, Ernest Mitchell, Carolyn Roberts

Lecturers Thomas Allen Harris, Tasha Hawthorne, Ferentz Lafargue, Sarah Mahurin

African Studies

Director of undergraduate studies: Veronica Waweru (veronica.waweru@yale.edu), 115 Prospect St., Room 148; director of the program in African Languages: Kiarie Wa'Njogu (john.wanjogu@yale.edu), 115 Prospect St., Room 138, 432-0110; www.yale.edu/macmillan/african

The program in African Studies enables students to undertake interdisciplinary study of the arts, history, cultures, politics, and development of Africa. As a foundation, students in the program gain cross-disciplinary exposure to Africa. In the junior and senior years, students develop analytical ability and focus their studies on research in a particular discipline such as anthropology, art history, history, languages and literature, political science, or sociology, or on topics such as global health, economic development, or human rights.

African Studies provides training of special interest to those considering admission to graduate or professional schools or careers in education, journalism, law, management, medicine, politics, psychology, international relations, creative writing, or social work. The interdisciplinary structure of the program offers students an opportunity to satisfy the increasingly rigorous expectations of admissions committees and prospective employers for a broad liberal arts perspective that complements specialized knowledge of a field.

REQUIREMENTS OF THE MAJOR

The African Studies program consists of twelve term courses, including (1) one African Studies course in the humanities and one in the social sciences; (2) two years of an African language (Arabic, Kiswahili, Twi, Wolof, Yorùbá, isiZulu, or others with permission of the director of undergraduate studies (DUS), unless waived by examination); (3) one research methods course, AFST 5505 or an alternative course that either serves to deepen the area of focus or provide methodological tools for the senior essay, selected in consultation with the DUS; (4) four courses in an area of focus, such as anthropology, art history, history, languages and literature, political science, or sociology, or in an interdisciplinary program such as African American Studies; Ethnicity, Race, and Migration; or Women's, Gender, and Sexuality Studies; or in a cross-disciplinary area such as diaspora studies or development studies; and (5) AFST 4491, the senior essay. The required courses represent the core of the program and are intended to expose the student both to the interdisciplinary nature of African studies and to the methodologies currently being brought to bear on the study of African cultures and societies. Students who wish to pursue an area of focus not listed here should consult the DUS first.

Language requirement African Studies majors are required to complete two years of college-level study (or the equivalent) of an African language, and they are encouraged to continue beyond this level. For the language requirement to be waived, a student must pass a placement test for admission into an advanced-level course or, for languages not regularly offered at Yale, an equivalent test of speaking, listening, reading, and writing skills administered through the Center for Language Study. Students should begin their language study as early as possible. If the requirement is

waived, students must substitute other African Studies courses for the four required language courses.

With permission of the DUS, students may count courses in an additional language, such as French or Portuguese, toward the major requirements. Students are encouraged to include upper-level courses, especially those centering on research and methodology.

Program in African languages The language program offers instruction in five major languages from sub-Saharan Africa: Kiswahili (eastern and central Africa), Twi (western Africa), Wolof (western Africa), Yorùbá (western Africa), and isiZulu (southern Africa). African language courses emphasize communicative competence, using multimedia materials that focus on the contemporary African context. Course sequences are designed to enable students to achieve advanced competence in all skill areas by the end of the third year, and students are encouraged to spend a summer or term in Africa during their language study.

Courses in Arabic are offered through the Department of Near Eastern Languages and Civilizations. Noncredit instruction in other African languages is available by application through the Directed Independent Language Study program at the Center for Language Study. Contact the director of the Program in African Languages (john.wanjogu@yale.edu) for information.

Credit/D/Fail No more than one course taken for Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students are required to complete a senior essay in AFST 4491, working under the guidance of a faculty adviser. With prior approval by the DUS, a combined senior essay may be submitted for those pursuing a second major.

A preliminary statement indicating the topic to be addressed and the name of the faculty adviser must be submitted to the DUS by the end of the second week of the fall term in the senior year.

ADVISING

Students planning to major in African Studies should consult the DUS as early as possible.

Graduate work, M.A. program Students in Yale College are eligible to complete the M.A. in African Studies in one year of graduate work if they begin the program in the third and fourth undergraduate years. Students interested in this option must complete eight graduate courses in the area by the time of the completion of the bachelor's degree. Only two courses may be counted toward both graduate and undergraduate degrees. Successful completion of graduate courses while still an undergraduate does not guarantee admission into the M.A. program.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior req)

Distribution of courses 1 AFST course in humanities and 1 in social sciences; 2 years of African lang; 4 courses and 1 research methods course in focus area

Substitution permitted if language req is waived, 4 addtl African Studies courses

Senior requirement Senior essay (AFST 4491)

CERTIFICATES OF ADVANCED LANGUAGE STUDY

The Department of African Studies offers a Certificate of Advanced Language Study in three major African languages–Kiswahili, Yoruba, and isiZulu, and students may pursue a Certificate of Advanced Language Study in each of these languages. A certificate adviser, typically the director of undergraduate studies (DUS), advises students on the certification process and certifies to the University Registrar's Office that students have completed the stated requirements before the end of eight terms of study. The Certificate of Advanced Language Study, once certified, is listed on the student's transcript.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the adviser, one advanced non-L5 Yale course, conducted in the target language, such as an independent study course (graded pass/fail), a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course taught in English to count toward the certification requirements provided the course includes at minimum a weekly discussion section conducted entirely in the target language. The discussion section must enroll a minimum of three students and the course must be designated as LxC in the course description.

The certificate adviser may also approve the substitution of up to two credits earned during study abroad and taught in the target language to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure that those courses appear on their transcripts.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY ASSOCIATED WITH THE PROGRAM OF AFRICAN STUDIES

Professors Lea Brilmayer (*Law School*), John Darnell (*Near Eastern Languages & Civilizations*), Owen Fiss (*Law School*), Robert Harms (*History*), Daniel Magaziner (*History*), Roderick McIntosh (*Anthropology*), Christopher Miller (*African American Studies, French*), Catherine Panter-Brick (*Anthropology*), Jeremy Seekings (*Global Affairs*) (*Visiting*), Ian Shapiro (*Political Science*), Robert Thompson (*Emeritus*), Michael Veal (*Music*), David Watts (*Anthropology*), Elisabeth Wood (*Political Science*)

Associate Professors Robert Bailis (*School of the Environment*), Jonathan Wyrtzen (*Sociology*)

Assistant Professors Katharine Baldwin (*Political Science*), Louisa Lombard (*Anthropology*)

Lecturers Lacina Coulibaly (*Theater Studies*), Anne-Marie Foltz (*Public Health*), David Simon (*Political Science*)

Senior Lectors II Sandra Sanneh, Kiarie Wa'Njogu

Senior Lectors Oluseye Adesola, Matuku Ngame

American Studies

Director of undergraduate studies: Laura Wexler (laura.wexler@yale.edu), 314 WLH, 432-1524; americanstudies.yale.edu

The American Studies program encourages the interdisciplinary study of the cultures and politics of the United States, the changing representations of national identity, and the construction of borderland and diasporic cultures over time. Each student in the major combines courses in American Studies with courses from other relevant disciplines (literature, history, the arts, and the social sciences) to explore these broad topics from local, national, and global perspectives. Through the selection of curated courses, each student develops a focus for coursework in the major. The program encourages scholarly work in nontraditional combinations of disciplines; at the same time, however, it assumes and requires a substantial foundation of knowledge in the history and culture of the United States. Students interested in the major are encouraged to consult with the director of undergraduate studies (DUS) as early as possible.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the American Studies major requirements.

All students majoring in American Studies must take fourteen-term courses approved by the program's faculty. Although a good deal of freedom in course selection is permitted, it is expected that all students will acquaint themselves with the materials, skills, and perspectives of cultural studies. Accordingly, the major requires completion —preferably by the end of the sophomore year, but no later than the end of the junior year—of at least four gateway courses (AMST 1000–2999), including two in cultural history/cultural studies, one broad survey course in American literature, and one preparatory course for work in the student's area of concentration, to be selected in consultation with the DUS. One of these four courses must be listed as an "Early Americas" course on the American Studies website and indicated as such on Yale Course Search. Students may, with DUS permission, substitute a First-Year Seminar for a gateway course. An additional five concentration courses from diverse disciplines must be taken for a letter grade, one of which must incorporate a comparable topic from a non-U.S. perspective. Two electives chosen from the American Studies course offerings are also required.

Students must take two junior seminars (AMST 3000–3999) during their junior year. At least one of the seminars must fall within the student's area of concentration, described below. In each of the seminars, students are expected to demonstrate proficiency in interdisciplinary research and analysis through the production of critical essays on primary source materials or a paper of fifteen to twenty pages. Sophomores contemplating a junior term abroad are urged to take one of the junior seminars in the spring term of their sophomore year.

Areas of concentration Each American Studies major selects an area of concentration, normally in the fall of the junior year, from six possible choices: (1) national formations, (2) the international United States, (3) material cultures and built environments, (4) politics and American communities, (5) visual, audio, literary,

and performance cultures, and (6) public humanities. The concentration in national formations explores historic migrations, settlements, and encounters among peoples who have formed the American nation, with an emphasis on Native American history and the construction of America's frontiers and borderlands. The international United States concentration focuses on historic and contemporary diasporas, the role of the United States outside its national borders, and the flows of American peoples, ideas, and goods throughout the globe. Students in the material cultures and built environments concentration examine the formation of the American landscape from the natural to the human-made, including the development of American architecture and the visual and decorative arts. The concentration in politics and American communities investigates the emergence of social groups and their political struggles at the local and national levels, emphasizing the themes of power, inequality, and social justice. Majors with a concentration in visual, audio, literary, and performance cultures study American consumer culture, popular culture, representations, and media in relation to U.S. literatures. Students in the public humanities concentration explore various forms of public intellectual engagement, including museum studies, documentary work, public history, digital humanities, and archival based work in the visual or performing arts; senior projects in this area may consist of works or productions beyond the traditional scholarly essay. Students may also petition the DUS to develop an independent concentration.

Credit/D/Fail No more than two courses taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

During the senior year, each student in the major completes work in the area of concentration in one of three ways. First, the student may enroll in a senior seminar within the area of concentration (AMST 4000–4999). Students should apply interdisciplinary methods and undertake original research to produce a final paper of twenty to twenty-five pages. Students must complete all course requirements to fulfill the senior requirement. Students electing this option should submit the senior seminar registration form, signed by the seminar instructor, to the DUS and the undergraduate registrar.

Second, the student may complete a one-term senior project or essay (AMST 4491). The product should be a thirty-page essay or its equivalent in another medium. To apply for admission to AMST 4491, a student should submit a prospectus, signed by the faculty adviser, to the DUS and the undergraduate registrar.

Third, the student may enroll in the intensive major (AMST 4493 and 4494) and work independently for two terms. The intensive major offers an opportunity for significant original research leading to a substantial senior project. AMST 4493, 4494 carries two terms of credit; its final product should be a sixty-page essay or its equivalent in another medium. All students in the intensive major participate in a yearlong proseminar on theory and methods. One term of the two-term project may count as a course in the area of concentration. To apply for admission to AMST 4493 and 4494, a

student should submit a prospectus, signed by the faculty adviser, to the DUS and the undergraduate registrar.

As a multidisciplinary program, American Studies draws on the resources of other departments and programs in the University. The list of American Studies courses is meant to be suggestive only: apart from those courses required for the major, it is neither restrictive nor exhaustive. Students are encouraged to examine the offerings of other departments in both the humanities and the social sciences, as well as Residential College Seminars, for additional relevant courses. The stated area of concentration of each student determines the relevance and acceptability of other courses.

ADVISING

Combined B.A./M.A. degree program Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in American Studies.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 14 term courses (incl senior req)

Distribution of courses 4 gateway courses, as specified; 2 junior sems, 1 in area of concentration; 5 courses in area of concentration for letter grades, 1 on a related non-U.S. topic (1 may be one term of two-term senior project); 2 AMST electives

Substitution permitted 1 first-year sem for 1 gateway course; others with DUS permission

Senior requirement Senior sem (AMST 4000–4999) or one-term senior project (AMST 4491) related to area of concentration

Intensive major Same, except two-term senior project (AMST 4493 and 4494) is required

FACULTY ASSOCIATED WITH THE PROGRAM OF AMERICAN STUDIES

Professors Ned Blackhawk (*History),* David Blight (*History, African American Studies*), Daphne Brooks (*African American Studies, Women's, Gender, & Sexuality Studies, Music),* Alicia Schmidt Camacho (*Ethnicity, Race, & Migration*), Michael Denning (*English, Ethnicity, Race, & Migration*), Kathryn Dudley (*Anthropology*), Roderick Ferguson (*Women's, Gender, & Sexuality Studies*), Joanne Freeman (*History*), Beverly Gage (*History*), Jacqueline Goldsby (*English, African American Studies*), Scott Herring *(Women's, Gender, & Sexuality Studies*), Daniel HoSang (*Ethnicity, Race, & Migration*), Matthew Jacobson *(African American Studies, History*), Regina Kunzel *(History, Women's, Gender, & Sexuality Studies)*, Kathryn Lofton (*Religious Studies, History & Divinity, FAS Dean of Humanities*), Lisa Lowe (*Director of Postdoctoral Opportunities*) (*Ethnicity, Race, & Migration*), Mary Lui *(Head of Timothy Dwight College) (History),* Joanne Meyerowitz (*History*), Charles Musser (*Film & Media Studies, Theater Studies*), Tavia Nyong'o (*Theater & Performance Studies, African American Studies*), Gary Okihiro (*Ethnicity, Race, & Migration*), Stephen Pitti (*Head of Ezra Stiles College)*

(History, Ethnicity, Race, & Migration), Sally Promey (*Institute of Sacred Music, Divinity School*, *Religious Studies, History of Art*), Ana Ramos-Zayas *(Ethnicity, Race, & Migration, Women's, Gender & Sexuality Studies*), Marc Robinson (*Theater & Performance Studies, English*), Paul Sabin (*History, Environmental Studies*), Caleb Smith (*English*), Dara Strolovitch (*Women's, Gender, & Sexuality Studies, Political Science*), Michael Veal (*Music, African American Studies*), Kalindi Vora (*Ethnicity, Race, & Migration, Women's, Gender, & Sexuality Studies*), John Warner *(History of Science, Medicine, and Public Health, History*), Michael Warner (*English*), Laura Wexler *(DUS)* (*Women's, Gender, & Sexuality Studies*), Bryan Wolf

Associate Professors Rene Almeling (*Sociology*), Laura Barraclough *(Chair) (Ethnicity, Race, & Migration*), Crystal Feimster *(Head of Pierson College)* (*African American Studies, History*), Zareena Grewal (*Ethnicity, Race, & Migration, Religious Studies*), Greta LaFleur (*DGS) (Women's, Gender, & Sexuality Studies),* Albert Laguna (*Ethnicity, Race, & Migration*), Joanna Radin *(History of Science, Medicine, and Public Health, Anthropology, History*), Elihu Rubin (*Urbanism*), Edward Rugemer (*African American Studies*), Tisa Wenger (*Religious Studies, History & Divinity)*

Assistant Professors Hi'ilei Hobart *(Ethnicity, Race, & Migration),* Julian Posada, Madiha Tahir

Senior Lecturers James Berger, Karin Roffman (*Humanities, English, Associate Director of Public Humanities*)

Lecturers Ryan Brasseux *(Head of Davenport College)*, Quan Tran (*Ethnicity, Race, & Migration*), Dicky Yangzom

Anthropology

Director of undergraduate studies: Richard Bribiescas, 10 Sachem Street, Room 202, 432-3671; anthropology.yale.edu

Anthropology is the study of human cultural, social, and biological diversity from the distant past to the present day and around the world. The undergraduate major in Anthropology introduces students to key topics and approaches in three broad areas, also known as subfields: (1) the evolution of human and nonhuman primates, including the evolutionary biology of living people; (2) the archaeological study of human societies and cultures; (3) social, cultural, and linguistic dimensions of human life. In addition to gaining a broad understanding of these complementary areas of Anthropology, majors develop advanced skills in one or more subfields and may elect to pursue a formal concentration in archaeological, biological, or sociocultural anthropology, or in medical anthropology and global health (see Concentrations). Whatever their path through the major, students learn ways of understanding and engaging with humanity that emerge from the sciences, social sciences, and humanities, and they often complete synergistic coursework in other departments and programs. All students write a senior essay, often based on independent research, and many go on to careers that incorporate anthropological perspectives.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Anthropology major requirements.

Students are required to present twelve course credits toward their major, including at least one introductory or intermediate (1000-2000 level) course in each of the three subfields of anthropology, at least three advanced courses (3000-4000 level), not including numbers reserved for senior essay work, and a senior essay. With approval from the director of undergraduate studies (DUS), up to three courses may be selected from other departments as cognates. Cognate courses should be chosen to expand a student's knowledge in one of the subfields of anthropology or in an area of cross-disciplinary concentration. For example, cognate courses for biological anthropology may be found in Ecology and Evolutionary Biology, Earth and Planetary Sciences, or Psychology, while cognates for sociocultural anthropology may be found in Sociology, Environmental Studies, Ethnicity, Race, and Migration, and Women's, Gender, and Sexuality Studies. Appropriate areas of cross-disciplinary coursework also include area studies (e.g., African Studies), or topics such as law, health, gender and sexuality, environment and ecology, science and technology, race and ethnicity, and others.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval. See Study Abroad.

SENIOR REQUIREMENT

All majors are required to complete a substantial paper during their senior year, either in a seminar or in ANTH 4091. In most cases, the senior essay is a traditional written essay, although students may, in consultation with their adviser, propose to work in

and submit other media; such senior essays should still be accompanied by a 10-15 page written exposition of the work and its relationship to anthropology. There are three options for completing the senior essay:

Option 1: Students may write a paper in an advanced seminar. A seminar senior essay must be more substantial than a typical term paper, generally 20–25 pages long. It is evaluated by the seminar instructor and a second reader drawn from the Yale faculty. Students must obtain written approval for this option from the seminar instructor no later than the third week of the term. Students fulfilling the requirements of two majors may not apply a single seminar essay toward the senior requirement for both majors. The deadline for a seminar senior essay is the senior essay deadline, not the term paper deadline. Students choosing this option must take the seminar for which they write their essay *in addition to* the three advanced courses required for the major. *Note that some concentrations in Anthropology do not permit a seminar-style senior essay.*

Option 2: An independent essay on a subject of the student's choice, completed in ANTH 4091. A student pursuing this option must choose a topic and identify a faculty adviser by the end of the third week of the term in which the essay is to be written. By the same date, the adviser must approve a prospectus that outlines the topic, objectives, and methods of the essay, as well as a preliminary bibliography. The student should also inform the DUS of a preferred second reader by this time.

Option 3: A yearlong paper, begun in ANTH 4071 and completed in ANTH 4091. The yearlong essay is designed for students who wish to pursue more extensive independent projects than can be completed in a single term. Students must have their project approved by a faculty adviser who establishes the requirements for ANTH 4071; approval is required before the student registers for ANTH 4071, typically in the fall term of the senior year.

For options two and three, the adviser must have a faculty appointment in Anthropology, and the second reader must have a faculty appointment at Yale.

ADVISING

With permission of the DUS, students may apply up to two courses taken outside Yale as electives or cognates toward the Anthropology major. Such courses must have been approved for Yale College credit and may include courses taken on a year or term abroad or through summer study at another college or university. See Academic Regulations, section K, Special Academic Programs.

Graduate courses Most graduate seminars in anthropology are open to qualified undergraduates. Descriptions are available in the departmental office, 10 Sachem Street. Permission of the instructor and of the director of graduate studies is required.

STUDY ABROAD

Study abroad courses that are approved for Yale College and Anthropology credit may be used to replace one elective. If more than one such study abroad course credit is to be used for the major, it will come at the expense of one or more of the three cognate courses which may be taken in any Yale department or program with the approval of the DUS in Anthropology.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 course credits (incl senior req)

Distribution of courses At least one introductory or intermediate, 1000-2000 level course in each of three subfields; at least three advanced, 3000-4000 level courses (not incl ANTH 4071, 4091, or seminar senior essay)

Substitution permitted Up to 3 cognate courses in other departments or programs with DUS approval

Senior requirement Senior essay in advanced sem; or ANTH 4091; or yearlong essay in ANTH 4071 and ANTH 4091; students electing a concentration may have additional requirements specific to that concentration

CONCENTRATIONS

Majors may choose to concentrate in one of the following areas to take advantage of groups of related courses and recommended sequences. Each of these concentrations has its own requirements and recommendations that fit within the overall requirements of the anthropology major.

CONCENTRATION IN ARCHAEOLOGY

The archaeology subfield focuses on understanding societies and cultures through the study of their material remains. Students in anthropological archaeology develop skills that allow them to study sites that were inhabited or modified by people in the past (including sites from relatively recent or modern times), together with a variety of materials recovered at such places, from microscopic residues and chemical traces to monumental buildings and entire landscapes. They learn to develop and apply theoretical approaches from the social sciences and comparative data from ethnographic and historical sources, coupled with a growing range of scientific methods of analysis derived from the natural and biological sciences.

In addition, students should gain field experience by joining a summer field school. Many archaeological field schools are offered around the world, and students are encouraged to apply to the Albers or Coe fellowships to defer the costs. In special cases, laboratory or museum activities may substitute for field work with the approval of the DUS.

A concentration in Archaeology is similar to but also different from a major in Archaeological Studies. The Anthropology major with a concentration in Archaeology provides a strong background in anthropological theory, ethnography, and biological anthropology, in addition to archaeology. The Archaeological Studies major is an option for students who wish to pursue coursework in additional departments, such as Classics and Classical Civilizations, Near Eastern Languages and Civilizations, and History of Art, among others. Alternatively, students can choose to double major in Anthropology and Archaeological Studies.

All students with this concentration need to complete at least *six course credits* as indicated. Senior majors with a concentration in Archaeology should consult with their senior thesis advisor to complete a thesis pertinent to the archaeology subfield (alternative formats for fulfilling this requirement can be discussed with the thesis

advisor and DUS). Courses other than those listed below or tagged with departmental attributes (in YCS) may count with permission of the DUS.

Concentration requirements

See Links to the attributes indicating courses approved for this concentration: YC ANTH Archaeology, YC ANTH Adv Lab/Data Analysis, YC ANTH Theory

- 1 introductory survey course: ANTH 1171, ANTH 1172
- 1 foundational laboratory course: ANTH 3116L
- 1 advanced laboratory or data analysis course
- 1 theory course
- 1 seminar
- 1 area focused course with DUS approval

CONCENTRATION IN BIOLOGICAL ANTHROPOLOGY

The concentration in Biological Anthropology helps students understand human evolutionary biology, comparative primate behavior and biology, evolutionary genetics, and the hominin and primate fossil records. Students become knowledgeable about the fundamentals of evolutionary biology, mechanisms of evolution and population genetics, human and non-human primate behavioral ecology, life history and reproductive ecology, and the relationship of our species to other primates. They will be prepared to navigate research on human and non-human primates thoughtfully and ethically and will have a grounding in the principles of rigorous scientific research, quantitative reasoning, data analysis, data interpretation, and critical analysis of primary scientific literature.

The concentration in Biological Anthropology is distinguished from the major in Ecology and Evolutionary Biology by its focus on the evolutionary biology of humans and our primate relatives, including the use of genetics and endocrinology to address questions about both our evolution and our current world, and on the interplay of human biology and culture. Students are encouraged to gain solid scientific backgrounds by taking courses in related departments such as Ecology and Evolutionary Biology.

The concentration in Biological Anthropology overlaps with and complements the concentration in Medical Anthropology and Global Health in conceptual approaches and scientific methods. It complements the Department's Archaeology program by its coverage of the fossil and archaeological record for early human evolution and of the ecological, behavioral, and demographic context in which our own species emerged and successfully dispersed across the world. It complements the sociocultural and linguistic anthropology program by providing a comparative context for understanding how our species then came to manifest our contemporary unprecedented behavioral diversity and flexibility.

All students with this concentration need to complete at least *six course credits* in biological anthropology or cognates, not including the senior project. Senior majors should consult with their senior thesis advisor to complete a thesis with an emphasis on the biological subfield. Essays written as term papers for seminars do not meet the

senior requirement for this concentration. Courses other than those listed below or tagged with departmental attributes (in YCS) may count with permission of the DUS.

Concentration requirements

See Links to the attributes indicating courses approved for this concentration: YC ANTH Biological

- Required course: ANTH 1400
- 4 or more biological anthropology seminar or cognate electives
- at least 1 advanced seminar in biological anthropology

CONCENTRATION IN SOCIOCULTURAL ANTHROPOLOGY

A concentration in sociocultural anthropology engages students in the study of how different people live and understand the world, their aspirations and struggles, and how both shared and conflicting ideas, values, and interests are related to action and interaction in society. Study and research in sociocultural anthropology is grounded in wide-ranging social and cultural theory and take ethnography to be a primary mode of research and a key form of expression (whether through ethnographic texts or other media, such as film). This concentration offers students an opportunity to focus on many parts of the world; on areas of inquiry such as environmental anthropology, urban anthropology, or economic anthropology; and topics such as language, legal and political institutions, race and ethnicity, information, science, and technology, gender, sexuality, and the body, and more. Students completing a concentration in sociocultural anthropology will have excellent skills for interpreting cultural differences, understanding power and inequality, and connecting small-scale human lived experiences with an understanding of large-scale structures and transformations.

Students are encouraged to learn more about opportunities and sources of support for undergraduate research in anthropology.

Students in this concentration are also invited to explore the Certificate in Ethnography as a means to deepen and expand their interests in sociocultural anthropology through coursework in related academic units that engage with ethnographic methods and ethnography-informed scholarship, including (but not limited to): African American Studies, American Studies, Environmental Studies, Ethnicity, Race, and Migration (ER&M), History, History of Science, Medicine, and Public Health (HSHM), Political Science, Sociology, Urban Studies, and Women's, Gender, and Sexuality Studies (WGSS).

Note: The Anthropology Department does not offer an independent concentration in linguistic anthropology. Students interested in linguistic anthropology may concentrate on sociocultural anthropology and consult with the DUS and appropriate faculty about choosing courses most relevant to their interests.

There are *six required course credits* that may be applied to this concentration. With DUS approval, similar courses taught in the department, or a related department or program, may substitute. The senior requirement is not one of the concentration requirements; however, seniors should consult with their senior thesis advisor to complete a thesis emphasizing the sociocultural subfield. Courses other than those listed below or tagged with departmental attributes (in YCS) may count with permission of the DUS.

Concentration requirements

See Links to the attributes indicating courses approved for this concentration: YC ANTH Sociocultural, YC ANTH Linguistic

- 1 introductory course in sociocultural anthropology at the 1000 level
- 3 or more electives in sociocultural and linguistic anthropology at the 2000-4000 level
- ANTH 3720, the core research methods course, usually taken in the junior year. With DUS approval, a similar methods course taught in the Department, or a related department or program, may substitute.
- ANTH 3710, the core theory course, usually taken in the junior year

CONCENTRATION IN MEDICAL ANTHROPOLOGY AND GLOBAL HEALTH

The concentration in Medical Anthropology and Global Health (MAGH) addresses the biological, ecological, economic, political, and sociocultural dimensions of health, illness, and healing around the world. It brings together theories, frameworks, and ethnographic foundations from sociocultural anthropology with biocultural orientations and research approaches found in biological anthropology. Students learn theoretical and methodological tools to think critically about issues related to health research, practice, and policy. They address the biological, ethical, and sociocultural aspects of global health inequities, caregiving, medical and healing practices, technological innovations, and health interventions. The concentration encourages a mindful and critical look at how social conditions and inequalities shape the health and illness experiences of individuals, families, and populations. Students who choose a MAGH concentration may pursue further graduate academic study in medical anthropology, or careers in biomedical and health-related fields, including epidemiology, global health, nursing, medicine, and public health. Others may be interested in health policy and legal aspects of health care delivery, among other fields.

All students opting for this concentration must complete *six course credits* in medical anthropology, global health, or cognate disciplines. In consultation with their adviser and/or the DUS, and especially if they plan independent research, students may wish to take an appropriate methods course as well. The senior requirement is not one of the concentration requirements; however, seniors should consult with their senior thesis advisor to complete a thesis emphasizing the medical anthropology or global health subfield. Courses other than those listed below or tagged with departmental attributes (in YCS) may count with permission of the DUS.

Concentration requirements

See Links to the attribute indicating courses approved for this concentration: YC ANTH Medical

- ANTH 4848
- at least 1 seminar at the 3000- or 4000- level that supports their preparation for the senior essay
- 4 other electives

FACULTY OF THE DEPARTMENT OF ANTHROPOLOGY

Professors Richard Bribiescas, Richard Burger, Michael Dove (*School of the Environment*), Kathryn Dudley (*Anthropology/American Studies*), Eduardo Fernandez-Duque, Erik Harms, William Honeychurch, Marcia Inhorn, Paul Kockelman, Catherine Panter-Brick, Douglas Rogers, Eric Sargis, Helen Siu, Kalyanakrishnan Sivaramakrishnan, Anne Underhill, Claudia Valeggia, David Watts

Associate Professors Oswaldo Chinchilla, Yukiko Koga, Louisa Lombard, Lisa Messeri, Christen Smith (Anthropology/African American Studies)

Assistant Professors Jessica Thompson, Serena Tucci

Lecturers Carol Carpenter, Jane Lynch

Applied Mathematics

Director of undergraduate studies: John Wettlaufer (john.wettlaufer@yale.edu); **associate director of undergraduate studies**: Ian Adelstein (ian.adelstein@yale.edu)

Mathematical models are widely used throughout natural science, social science, and engineering in fields as diverse as physics, bioinformatics, robotics, image processing, and economics. Despite the broad range of mathematical settings and applications, there exists a core of essential concepts and techniques used in addressing most problems. The Applied Mathematics major provides a foundation in these mathematical techniques and prepares the student to use them in a substantive field of application.

The interdisciplinary major permits a great deal of flexibility in design. It is intended to appeal to students who wish to study the more mathematical aspects of science or engineering, as well as those whose primary interest is in mathematics and statistics and who wish to become acquainted with applications. Core courses are drawn from Computer Science, Mathematics, Statistics and Data Science, and Engineering and Applied Science. Courses applying mathematics may be drawn from participating programs in Applied Physics; Astronomy & Astrophysics; the biological sciences, including Ecology and Evolutionary Biology, Molecular Biophysics and Biochemistry, and Molecular, Cellular, and Developmental Biology; Chemistry; Economics; the various programs in engineering, including Biomedical Engineering, Chemical Engineering, Electrical Engineering, Environmental Engineering, and Mechanical Engineering; Earth and Planetary Sciences; Physics; and even Linguistics and Political Science. The Applied Mathematics degree program requires a three-course concentration in a field in which mathematics is used.

Students in the major are often sought after by graduate programs in either Applied Mathematics or in the disciplines in which they choose their concentration, as well as by industries and startup companies in which their breadth of quantitative skills are essential and often unique.

Students may pursue a major in Applied Mathematics as one of two majors and can thereby equip themselves with mathematical modeling skills while being fully engaged in a field of application. In this case, the concentration requirement of the Applied Mathematics program is flexible in order to recognize the contribution of the other major. A two-course overlap is permitted to satisfy the requirements of the two majors.

Frequently Asked Questions Students are encouraged to consult the Applied Mathematics FAQ for more details about courses and policies in the major.

PREREQUISITE AND INTRODUCTORY COURSES

Multivariable calculus and linear algebra are required and should be taken before or during the sophomore year. This requirement may be satisfied by MATH 1200 or ENAS 1510, and MATH 2220 or 2250 or 2260. Computer programming skills are also required and may be acquired by taking ENAS 1300 or CPSC 1001 . Details of individual programs must be worked out in consultation with the director of undergraduate studies (DUS), whose signed permission is required.

REQUIREMENTS OF THE MAJOR

The B.A. degree program The program requires eleven term courses beyond the prerequisites, including the senior project, comprising a coherent program:

1. A course in differential equations (ENAS 1940 or MATH 2460)

2. A course in probability (S&DS 2410 or S&DS 2380)

3. A course in data analysis (S&DS 3610 or S&DS 2300)

4. A course in discrete mathematics (AMTH 2440 or CPSC 2020)

5. Courses in at least three of the following areas* (with DUS approval) including, but not limited to:

(a) optimization: AMTH 4310, 4370, EENG 433, 4000, CPSC 4850, S&DS 4320

(b) probability and statistics: S&DS 2420, 3120, 3510, 3640, 4000, 4100, 4110, 4250, ECON 2136, APHY 4700

(c) partial differential equations and analysis: MATH 2470, 2550, 2560, 2600, 3020, 3050, 3100, 3200, 3250, 4470, AMTH 4280

(d) algorithms and numerical methods: CPSC 3650, 3660, 4240, 4371, 4410, 4650, 4660, 4670, 4680, 4690, 6400, ENAS 4400, ENAS 4410

(e) graph theory: AMTH 3620, AMTH 4200, 5620, MATH 7990, CPSC 4620

(f) mathematical economics: ECON 2125, 2126, 3350, 3351, 4417, 4428, 4433, 2251, 4471, CPSC 4550

(g) electrical engineering: ECE 4390, AMTH 3420, S&DS 3640

(h) data mining and machine learning: S&DS 2620, 2660, 3650, 6690, 6710, 6850, CPSC 4391, 4520, 4530, 4700, 4740, 4770, 3810, 4830, 4860, 4880, 7450, AMTH 5520, AMTH 2320

(i) biological modeling and computation: CPSC 4530, 4750, 4760, BENG 3400, 4450, BENG 4580, PSYC 2658

(j) physical sciences: ASTR 3200, 4200, CHEM 3330**, EPS 3220, 3230, 4210, 4280, 4560, 5290, 6590, 3430, 3440, 4010, 4020, 4100, 4120, 4500, 4300, 4400, 4410, 4420, APHY 4390, 4480

(k) engineering: MENG 2311, 2615, 3422, 3465, 3323, 4463, 4469, CENG 3010, 3150, BIS 555

(l) mathematical linguistics: LING 2249, LING 2270, LING 3800

(m) mathematical philosophy: PHIL 2267, 4427, MATH 2700

* Because departmental curricula from which the program draws regularly change, the DUS maintains a more exhaustive list of courses and areas satisfying this particular requirement. Additionally, due to rapid advances in many areas, these categories are often fluid, and their union can evolve. In order to accommodate this fluidity, students are strongly encouraged to revisit their program of study each term and share their checklist with the DUS. Students can independently and systematically plan multiple

routes toward completion of the major by using the checklist and the master list of courses.

** Chemistry courses numbered 410 and above may count as a breadth requirement (either 1 full-term 1 credit course or 2 half-credit courses) with permission of the DUS.

6. At least *three advanced courses* in a field of concentration involving the application of mathematics to that field. The standard way to form a concentration is to take three courses all from the same breadth (a)-(m) category from item 5 above, at least two of which are level 3000+. Any concentration that deviates from this standard formula must be worked out in consultation with, and approved by, the DUS.

Alternatively, when two majors are undertaken, if the second major is in a participating program, then, recognizing that there can be an overlap of two courses, the student may take for the remaining concentration course an additional choice relevant to the Applied Mathematics major such as those listed in point 5 above or for the B.S. degree below. Details of a student's program to satisfy the concentration requirement must be worked out in consultation with, and approved by, the DUS.

The B.S. degree program In addition to the courses indicated for the B.A. degree, the B.S. degree, which totals fourteen term courses beyond the prerequisites and includes the senior requirement, must also include the three items listed below.

1. A vector analysis course (MATH 3020 or MATH 3050). MATH 3100, 3200, 3250, and 4470 and those 3000+ level courses listed under "(c) partial differential equations and analysis" can act as replacements.

The course selected may not be counted toward the requirements for the major under item 5 above. (MATH 3500 and MATH 4400 can in specific cases be considered in consultation with the DUS.)

2. An additional course selected from item 5 above.

3. Another course numbered 3000 or higher selected from item 5 above, or a course numbered 3000 or higher in mathematics, applied mathematics, statistics, or quantitative computer science or engineering, or as approved by the DUS.

Alternatively, students may petition to receive a B.S. in Applied Mathematics by fulfilling the B.A. requirements in Applied Mathematics and the B.S. requirements in another program.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major.

Distinction in the major Earn a grade of A or A– in at least 9/11 of the non-prerequisite courses in the Applied Math B.A., or at least 11/14 of the non-prerequisite courses in the B.S. One of those A's or A–'s must come from AMTH 4900 or AMTH 4910, with the rest coming from core, concentration, and/or breadth courses. Grades of Cr in classes taken Cr/D/F count as non-A grades. Grades earned in prerequisite courses (multivariable calculus, linear algebra, and programming), and grades of P or W, do not count in the calculation.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Both the B.A. and B.S. degree programs require a senior thesis research project (AMTH 4910).

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites MATH 1200 or ENAS 1510, and MATH 2220 or 2250 or 2260, or equivalents; ENAS 1300, or CPSC 1001

Number of courses *B.A.*—11 term courses beyond prereqs (incl senior req); *B.S.*—14 term courses beyond prereqs (incl senior req)

Specific courses required *B.A.*—ENAS 1940 or MATH 2460; S&DS 2410 or S&DS 2380; S&DS 3610 or S&DS 2300; AMTH 2440 or CPSC 2020; *B.S.*—same as *B.A. degree*

Distribution of courses *B.A.*—at least 3 advanced courses in a concentration concerning the application of math to that field; 3 addtl courses, as specified; *B.S.*—same as *B.A. degree*, plus MATH 3020 or 3050 (or MATH 3500 and 4400 with DUS approval), with 2 addtl courses, as specified

Senior requirement Senior thesis research project (AMTH 4910)

FACULTY ASSOCIATED WITH THE PROGRAM OF APPLIED MATHEMATICS

Professors Andrew Barron (*Statistics & Data Science*), David Bercovici (*Earth & Planetary Sciences*), Donald Brown (*Emeritus*) (*Economics, Mathematics*), Joseph Chang (*Statistics & Data Science*), Ronald Coifman (*Mathematics*), Michael Fischer (*Computer Science*), Igor Frenkel (*Mathematics*), Anna Gilbert (*Mathematics, Statistics & Data Science*), Roger Howe (*Emeritus*) (*Mathematics*), Peter Jones (*Mathematics*), John Lafferty (*Statistics & Data Science*), A. Stephen Morse (*Electrical Engineering*), Corey O'Hern (*Mechanical Engineering & Materials Science*), David Pollard (*Statistics & Data Science*), Nicholas Read (*Physics, Applied Physics*), Vladimir Rokhlin (*Computer Science, Mathematics*), John Schotland (*Mathematics*), Peter Schultheiss (*Emeritus*) (*Electrical Engineering*), Martin Schultz (*Emeritus*) (*Computer Science*), Mitchell Smooke *(Mechanical Engineering & Materials Science, Applied Physics*), Daniel Spielman (*Computer Science, Statistics & Data Science*), Mary-Louise Timmermans *(Earth & Planetary Sciences),* Van Vu *(Mathematics),* Günter Wagner *(Ecology & Evolutionary Biology),* John Wettlaufer *(Earth & Planetary Sciences, Mathematics, Physics),* Huibin Zhou (*Statistics & Data Science*), Steven Zucker (*Computer Science, Biomedical Engineering*)

Associate Professors John Emerson (*Statistics & Data Science*), Thierry Emonet (*Molecular, Cellular, & Developmental Biology, Physics*), Josephine Hoh (*Epidemiology & Public Health*), Yuval Kluger (*Pathology*), Michael Krauthammer *(Pathology*), Smita Krishnaswamy (*Genetics, Computer Science*), Sekhar Tatikonda (*Electrical Engineering, Statistics & Data Science*), Madhusudhan Venkadesan (*Mechanical Engineering & Materials Science*)

J. W. Gibbs Assistant Professors Yariv Aizenbud, Abinand Gopal, Erik Hiltunen, Boris Landa, Kevin O'Neill

Applied Physics

Director of undergraduate studies: Daniel Prober (daniel.prober@yale.edu), 417 BCT, 432-4280; appliedphysics.yale.edu

Physics is the study of the fundamental laws of nature. Applied physics uses these laws to understand phenomena that have practical applications. Engineering in turn makes use of these phenomena for human purposes. Applied physics thus forms a link between the fundamental laws of nature and their applications. Students majoring in Applied Physics take courses in both physics and engineering, as well as courses specifically in applied physics. Students completing the program in Applied Physics are prepared for graduate study in applied physics, in physics, in nanoscience, or in engineering, and, with appropriate prerequisites, in medicine; or they may choose careers in a wide range of technical and commercial fields, or in fields such as technical writing or patent law that draw on interdisciplinary subjects.

Contemporary physical science and engineering are becoming increasingly interdisciplinary. Traditional boundaries between fields have blurred, and new areas are constantly emerging, e.g., nanotechnology. The Applied Physics major provides a flexible framework on which students can build a curriculum tailored to their own interests, in consultation with the director of undergraduate studies (DUS).

PREREQUISITES

During their first year, students interested in Applied Physics should start by taking courses in mathematics, and in physics if possible, appropriate to their level of preparation. The choice between different starting points is generally made based on performance on Advanced Placement tests. The multiplicity of choices facing students interested in this general area indicates the importance of informed advice for first-year students. Students should consult freely with DUSs and individual faculty members in their departments of interest to optimize choices and to ensure maximum flexibility at the time a major is selected.

The required prerequisites for students interested in Applied Physics include two physics courses and one physics lab; APHY 1510 or MATH 1200; and PHYS 4000 (or APHY 1940 with either MATH 2220 or MATH 2250 or MATH 2260).

The recommended starting courses in physics are PHYS 2000 and 2010. These courses should be taken in the first year by students who have a strong preparation in mathematics and physics. Students with a particularly strong background in physics and mathematics may take PHYS 2600 and 2610 instead. Students who are less well prepared in physics and mathematics may choose to take PHYS 1800 and 1810 during their first year, or PHYS 2000 and 2010 during their sophomore year after they have taken additional mathematics courses. One laboratory course, PHYS 1660L or 2060L, should be taken at some time during the first or second year.

REQUIREMENTS OF THE MAJOR

The major in Applied Physics requires eight courses beyond the introductory sequence. Two of these must be APHY 4710 and 4720. All majors are also required to take APHY 3220, APHY 4390 or PHYS 4400, and APHY 4200, or equivalents. The three remaining advanced courses should comprise an area of focus. For example, a student interested in solid-state and/or quantum electronics might choose from APHY 3210,

4480, 4490, ECE 3200, and 3250. A student interested in the physics of materials and/or nanoscience might choose from APHY 4480, 4490, CHEM 2200, and MENG 2615. Many other focus areas are possible.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major with permission of the DUS. The senior special projects, APHY 4710 and 4720, may only be taken for a letter grade.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Seniors must complete an independent research project, taken as APHY 4710 and 4720. The independent research project is under the supervision of a faculty member in Applied Physics, Physics, Engineering, or related departments. The project may be started in the junior year and continued into the senior year. Students planning to do a research project should contact the DUS as early as possible to discuss available options and general requirements.

ADVISING

The Applied Physics major provides various programs corresponding to a range of student interests. Substitutions of equivalent courses may be permitted. Students interested in an Applied Physics major should contact the DUS as early as possible, and in any case by the end of their sophomore year.

A well-prepared student interested in materials physics or quantum electronics who starts the senior research in the junior year might elect the following course sequence:

First-Year	Sophomore	Junior	Senior
APHY 1510	APHY 3220	APHY 4720	APHY 4480
PHYS 2000	APHY 4390	ECE 3200	APHY 4490
PHYS 2010	PHYS 4000	APHY 4200	APHY 4710
PHYS 2060L			

A student interested in alternative energy who starts physics in the sophomore year and conducts research in the senior year might elect:

First-Year	Sophomore	Junior	Senior
MATH 1200	PHYS 2000	APHY 3220	APHY 4480
	PHYS 2010	APHY 4390	APHY 4710
	PHYS 2060L	ECE 3200	APHY 4720
	PHYS 4000	APHY 4200	ECE 4061

REQUIREMENTS OF THE MAJOR

Prerequisites PHYS 1800, 1810, or PHYS 2000, 2100, with appropriate math coreqs and PHYS 1660L or 2060L; APHY 1510 or MATH 1200; PHYS 4000 (or APHY 1940 with either MATH 2220 or MATH 2250 or MATH 2260)

Number of courses 8 term courses beyond prereqs (incl senior req)

Distribution of courses 3 adv courses in physical or mathematical sciences or engineering in area of focus, with DUS approval

Specific courses required APHY 3220, 4390 or PHYS 4400, and APHY 4200, or equivalents

Substitution permitted Any relevant course approved by DUS

Senior requirement APHY 4710 and 4720

FACULTY OF THE DEPARTMENT OF APPLIED PHYSICS

Professors Charles Ahn, †Sean Barrett, Hui Cao, Michel Devoret, Paul Fleury (*Emeritus*), †Steven Girvin, †Leonid Glazman, †Jack Harris, Victor Henrich (*Emeritus*), Sohrab Ismail-Beigi, Simon Mochrie, †Corey O'Hern, Vidvuds Ozolins, Daniel Prober, Nicholas Read, Peter Schiffer, Robert Schoelkopf, †Ramamurti Shankar, †Mitchell Smooke, A. Douglas Stone, †Hongxing Tang, Robert Wheeler (*Emeritus*), Werner Wolf (*Emeritus*)

Associate Professors †Michael Choma, Peter Rakich

Assistant Professors Yu He, Owen Miller, Shruti Puri

†A joint appointment with primary affiliation in another department.

Archaeological Studies

Director of undergraduate studies: William Honeychurch (william.honeychurch@yale.edu), archaeology.yale.edu

This interdisciplinary major is supervised by the University's Council on Archaeological Studies. Inquiries about the major may be addressed to the chair of the council, Richard Burger (richard.burger@yale.edu), Department of Anthropology, 10 Sachem St., or to the director of undergraduate studies (DUS).

The major in Archaeological Studies provides a program of interdepartmental offerings covering prehistoric, early historic, medieval, and other cultures and cultural developments in the Old and New Worlds and introduces students to the analytic tools that facilitate archaeological studies. The major is designed to expose students to a variety of archaeological research perspectives: anthropological, historical, art historical, and scientific. Also emphasized are substantive studies including (1) study of prehistoric–early historic transformations such as the origins of agriculture, cities and states, and early empires, and (2) study of the material culture, art, and architecture of prehistoric, early historic, and medieval cultures, including the iconography of ancient cultures, the relationship between art and society, ancient writing systems, and American historical archaeology.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Archaeological Studies major requirements.

The major consists of twelve term courses, including the senior project. In addition, students must participate in a Yale-affiliated summer research project, or that of another archaeological field school approved in advance by the DUS. The following five courses are required: an introductory survey; the introductory laboratory course ARCG 3116L; an advanced laboratory course; a theory course; and the senior research project ARCG 4491. The remaining seven courses required for the major must be distributed among the subject areas represented by the departments and programs offering courses multiple-titled with Archaeological Studies, with three of those seven courses found in different departments and programs. The relevant departments and programs are Anthropology, Classics, Earth and Planetary Sciences, Environmental Studies, History, History of Art, Near Eastern Languages and Civilizations, and Religious Studies. With the permission of the DUS, a course may be counted toward a subject area other than the one(s) under which it is listed. For three of the seven archaeology electives students may, with permission of the DUS, substitute courses from other departments in areas related to their research.

Field research In addition to being the base for several faculty field projects around the globe, the Council on Archaeological Studies takes as its principal mission the encouragement of multiple field experiences. Our undergraduate majors are required to participate in at least one intensive summer field school. Approval is required, and costs are often subsidized by the Council. Students are encouraged to participate in each other's field projects, thereby learning about the greatest number of cultures and areas possible, while experiencing a diverse array of field situations.

Students are strongly encouraged but are not required, to devote a second summer to archaeological research, either in the field or in a laboratory. Council faculty currently direct archaeological field projects in China, Egypt, Guatemala, Peru, Mongolia, Armenia, and Italy. Qualified majors are encouraged to apply for research positions with these projects.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The final requirement for the major is a senior research project (ARCG 4491) in some field of archaeology, preferably one involving more than one area or discipline.

ADVISING

Students majoring in Archaeological Studies should consult with the DUS at the beginning of each term.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior project)

Specific course required ARCG 3116L (intro lab)

Distribution of courses 1 intro survey; 1 advanced lab; 1 theory course; 7 electives, at least 1 in each of 3 areas, as specified

Field requirement 1 summer field techniques course or research project, as specified and approved by the DUS

Substitution permitted For 3 electives, 3 courses related to research, with DUS permission

Senior requirement Research project (ARCG 4491)

COUNCIL ON ARCHAEOLOGICAL STUDIES

Anthropology Richard Burger (*Chair*), Oswaldo Chinchilla, Ellery Frahm, Piphal Heng, William Honeychurch, Roderick McIntosh (*Emeritus*), Eric Sargis, Jessica Thompson, Anne Underhill, David Watts

Classics Andrew Johnston, Milette Gaifman

Earth and Planetary Sciences Ronald Smith

History Joseph Manning

History of Art Edward Cooke, Jr., Allison Caplan, Alexander Ekserdjian

Near Eastern Languages & Civilizations John Darnell, Eckart Frahm, Gregory Marouard, Nadine Moeller, Harvey Weiss

Religious Studies Stephen Davis

Architecture

Director of undergraduate studies: Michael Schlabs (michael.schlabs@yale.edu), RDH, 180 York St.; architecture.yale.edu

Architecture is a humanistic endeavor. The purpose of the undergraduate major is to include the study of architecture within a comprehensive liberal arts education, drawing from the broader academic and professional environment of the Yale School of Architecture. The curriculum includes work in design; in history, theory, and criticism of architecture; and in urbanism, and leads to a bachelor of arts degree with a major in Architecture. As a liberal arts major in Yale College, it is not an accredited professional degree program. For accredited professional degree programs, refer to the requirements of the National Architectural Accrediting Board (NAAB).

INTRODUCTORY COURSES FOR NONMAJORS AND MAJORS

Introductory courses are ARCH 1001, 2000, and 2600. They are open to all Yale College students and are required for those interested in the Architecture major prior to submitting a Declaration of Intent to Major. Interested students may also consider courses such as ARCH 1300, 1600, 2001, 2003, 2103, or 2601.

PREREQUISITES

Three courses are prerequisite for all concentrations: ARCH 1001; 2000; and *one* of the following: ARCH 2103, 2600, or 2601.

REQUIREMENTS OF THE MAJOR

Students majoring in Architecture are required to take fifteen course credits, including prerequisites and the senior requirement. Majors are expected to take the three prerequisites by the end of their sophomore year and to complete a core of four courses, for five course credits, by the end of their junior year. They must also base their studies in one of two areas of concentration: the Design concentration or the History, Theory, Criticism of Architecture, and Urbanism concentration. Majors are also required to complete three orientation sessions: advanced technology orientation, library orientation, and shop orientation. Within the concentrations, electives are categorized under four broad subject areas: history and theory of architecture and the city; urbanism and landscape; materials and design; and structures and computation.

Design concentration The Design concentration explores the role of architecture in shaping the world around us. It introduces complex processes involved in solving spatial and programmatic problems. Creative work is grounded in the study of history and culture, and in the analysis of social conditions influencing architecture. Design studios provide a forum for production and discourse. Studio projects address issues of architectural form, space, composition, site, tectonics, and programs within broader humanistic ideals.

For the Design concentration, the following additional courses are required:

1. A core of four courses: the studio courses ARCH 3000 and 3001 taken during the junior year after the student is accepted into the major; and the history of architecture surveys, ARCH 2001 and 2003, to be completed by the end of the junior year

2. One elective in history and theory of architecture and the city as outlined in the elective options below
3. One elective in urbanism and landscape as outlined in the elective options below
4. One elective in materials and design as outlined in the elective options below
5. One elective in structures and computation as outlined in the elective options below
6. The senior requirement, ARCH 4000 and 4001

History, Theory, Criticism of Architecture, and Urbanism concentration The History, Theory, Criticism of Architecture, and Urbanism concentration is intended to establish a broad historical and intellectual framework for the study of architecture and the city. An interdisciplinary approach is encouraged through additional courses taken in various fields of humanities and social sciences. Such courses may include archaeology, urban studies, aesthetics, philosophy, or visual culture. Permission of the director of undergraduate studies (DUS) is required if the courses fall outside the specified course of studies. During their senior year students complete a senior essay or project on a topic approved by the faculty.

For the History, Theory, Criticism of Architecture, and Urbanism concentration, the following additional courses are required:

1. A core of four courses: ARCH 3000 taken during the fall term of junior year; a second design studio or urban laboratory (e.g. ARCH 3301, ARCH 3305) or an elective approved by the DUS, taken during the spring term of junior year; and the history of architecture surveys ARCH 2001 and 2003 to be completed by the end of junior year
2. Four electives in history and theory of architecture and the city, as outlined in the elective options below and approved by the DUS
3. One elective in urbanism and landscape, materials and design, or structures and computation, or other relevant course approved by the DUS as outlined in the elective options below
4. The senior requirement, ARCH 4900 and 4910

ELECTIVE OPTIONS IN SUBJECT AREAS

See Links to the attributes indicating courses approved for Architecture major requirements.

History and theory of architecture and the city Electives can be chosen from ARCH 0002, 2101, 3102, ARCH 3103, 3108, 3115, 3601, 3106, 3400, 3602, 3109, 2103, 3110, or other relevant courses in History of Art and other, related fields approved by the DUS. Examples of approved courses include: HSAR 1143, 1160, 3221, and 4432.

Urbanism and landscape Electives can be chosen from ARCH 1600, 3102, ARCH 3103, 3601, 2601 or other relevant courses in American Studies; Ethics, Politics, and Economics; Environmental Studies; or Political Science approved by the DUS. Examples include: AFAM 1946, 1964, 2961, and 3326; AFST 2238, and 3366; AMST 0031, 2258, 3310; ER&M 2000, 1678, 3393; EVST 2219, 3255; SOCY 2001, 2103, 3715.

Materials and design Electives can be chosen from ARCH 1300, 1301, 3400; ART courses in drawing, painting, sculpture, or graphic design; or any other relevant course approved by the DUS.

Structures and computation Electives can be chosen from ARCH 1400, an approved calculus course such as MATH 1120, 1150, 1200, or physics course such as PHYS 1800, 2000 or other relevant course approved by the DUS. One example of an approved course is MENG 2311. (Elementary calculus is strongly recommended as preparation for graduate studies in architecture.)

REQUIRED ORIENTATIONS

Advanced Technology orientation All Architecture students are required to complete orientation sessions in the advanced technology workshop and materials laboratory. Students enrolled in ARCH 2000 must complete these sessions at the beginning of the spring term of the sophomore year. Access to digital media equipment is not allowed until the required orientation sessions have been completed. Questions should be addressed to the DUS or the director of advanced technology, Vincent Guerrero (vincent.guerrero@yale.edu), 432-7552.

Library orientation The Architecture program requires all students to complete a ninety-minute introductory library research session. Students enrolled in ARCH 2000 must take this session at the beginning of the spring term of their sophomore year. Failure to complete the required orientation precludes completion of the major. Students may not offer substitutions for this orientation. Orientation sessions may be coordinated by the Arts Librarian for Research Services, Tess Colwell, 432-2641. Questions should be addressed to the DUS.

Shop orientation The Architecture program requires all majors to complete several woodshop and materials lab orientation sessions. Students who plan to enroll in ARCH 3000 must take these sessions at the beginning of the fall term in the junior year, before the first day of classes. Access to the woodshop and materials lab is not allowed until the required orientation sessions have been completed. Questions should be addressed to the DUS or to the shop coordinator, Timothy Newton (timothy.newton@yale.edu), 432-7234.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Seniors in the Design concentration take ARCH 4000 in the fall term and 4001 in the spring term. Seniors in the History, Theory, Criticism of Architecture, and Urbanism concentration take ARCH 4900 in the fall term and 4910 in the spring term. Proposals for senior projects and essays are submitted in the fall term for review and approval by the senior project coordinator; they are then distributed to faculty members for review. Upon successful review, students may ask faculty members to act as senior advisers. Senior essays and projects for ARCH 4910 are due in the office of the DUS by early April. Design projects for ARCH 4001 are due as specified by the course instructor. All

seniors must submit a portfolio of their work to the office of the DUS by the end of spring semester. For all architecture majors, this portfolio must be representative of the student's design work including prerequisites and the senior project. History, Theory, Criticism of Architecture, and Urbanism majors must also include a copy of the senior essay and other appropriate texts.

ADVISING AND DECLARATION OF INTENT TO MAJOR

Yale College students interested in the Architecture major must submit a Declaration of Intent to Major during the spring term of their sophomore year, after taking ARCH 1001, 2000, and one of the following: ARCH 2103, 2600, or 2601. The Declaration of Intent to Major form, available on Yale Hub, must be submitted to the office of the DUS (contact DUS for deadlines) and must include the following information: name, address, telephone number, courses related to architecture already taken, and a statement of purpose. Students should also indicate their desired concentration at this time. Additionally, students are required to submit a writing sample in the form of a paper from ARCH 2600 (or other course approved by the DUS), and are encouraged to submit an electronic portfolio representative of coursework for ARCH 1001 and 2000. Upon the successful completion of these requirements, students are notified in writing regarding their acceptance to the major. Refer to the department website for important deadlines.

Courses in the School of Architecture Unless otherwise indicated in the course descriptions, all courses in the School of Architecture are open to majors and nonmajors with permission of the instructor and the graduate registrar. They are not available for the Credit/D/Fail option. Students are admitted on the basis of their previous coursework and previous performance.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites ARCH 1001, 2000, and *one of the following:* ARCH 2103, 2600, or 2601

Number of courses 15 course credits (incl prereqs and senior req)

Specific courses required *Design concentration*—ARCH 3000, 3001, 2001, 2003; *History, Theory, Criticism of Architecture and Urbanism concentration*—ARCH 3000; ARCH 3301, 3305, or an elective course approved by DUS; ARCH 2001; and ARCH 2003

Distribution of courses *Design concentration*—1 elective in history and theory of arch and the city, 1 in urbanism and landscape, 1 in materials and design, 1 in structures and computation, all approved by DUS; *History, Theory, Criticism of Architecture, and Urbanism concentration*—4 electives in history and theory of arch and city; 1 elective in urbanism and landscape, or materials and design, or structures and computation, or other relevant course; all approved by DUS

Other requirements Orientation sessions in advanced technology, library, and shop

Senior requirement *Both concentrations*—portfolio representative of design work, including prereqs and senior req; *Design concentration*— ARCH 4000 and ARCH 4001; *History, Theory, and Criticism of Architecture and Urbanism concentration*—ARCH 4900 and 4910

MEMBERS OF THE SCHOOL OF ARCHITECTURE TEACHING IN YALE COLLEGE

Professors Turner Brooks (*Adjunct*), Keller Easterling, Steven Harris (*Adjunct*), Eeva-Liisa Pelkonen, Alan Plattus, Alexander Purves (*Emeritus*)

Associate Professors Kyoung Sun Moon, Elihu Rubin

Assistant Professors Anthony Acciavatti (*Visiting*), Sunil Bald (*Adjunct*), Joyce Hsiang, Bimal Mendis (*Adjunct*)

Senior Lecturers Marta Justo Caldeira, Bryan Fuermann

Lecturers Kyle Dugdale, Jerome Haferd, Erleen Hatfield, Justin Moore

Senior Critics Katherine Davies, Andrei Harwell, Gavin Hogben

Critics Anne Barrett, Adam Hopfner, George Knight, Timothy Newton, M. Surry Schlabs

Art

(Drawing, Filmmaking, Graphic Design, Painting/Printmaking, Photography, and Sculpture)

Director of undergraduate studies: Alexandria Smith (alexandria.m.smith@yale.edu); art.dus@yale.edu, (art.dus@yale.edu) 122 GRN, 432-2600; art.yale.edu

Students in the Art major develop a critical and practical understanding of the visual arts and design through a studio-based curriculum that organically blends practice with critical thinking and art historical precedents; apply fundamentals of visual art across a variety of mediums and disciplines; relate the practice of making art and design to culture and the study areas of art history and theory; and learn to embody the knowledge and practice of at least one artistic discipline through active search and research. Students may concentrate on a medium such as painting/printmaking, sculpture, graphic design, photography, or filmmaking, and interdisciplinary study is supported. Art majors learn to place their own work in the context of an inclusive group of contemporary art worlds and national and global cultures. This study is a crucial element in a liberal arts curriculum both for future arts practitioners and for those ultimately studying and working in other fields. A key element of the creative learning process is the critique, which is implemented via both group settings and one-on-one studio visits with faculty and visiting critics. Through rigorous practice and regular feedback, a student gains insight into one's own critical voice. Art majors have access to the graduate program by attending regular lectures, critiques, events, and exhibitions that represent a diverse set of art practitioners who regularly visit the School of Art.

COURSES FOR NONMAJORS AND MAJORS

Courses in Art are open to all undergraduate students, but are registered by permission of instructor only due to limited class size. In cases where student demand for entry into a course is greater than can be accommodated, priority is given to School of Art students and declared Art and Computing and the Arts majors. The director of undergraduate studies (DUS) and members of the Art faculty typically hold counseling meetings during the registration period. See the Art department website listed above for more information. Students seeking advice about course selection or the program in Art should attend these advising sessions. Others wishing to elect an Art course should visit the course's Canvas site for details, and request instructor permission during the registration period to apply for these limited-enrollment classes. Many studio art courses require the purchase of a limited number of supplies in addition to the materials provided in the class. All Art majors are required to register with the DUS at the beginning of each term to be enrolled or to continue in the major, as well as participate in the sophomore review in the fourth term.

PREREQUISITES

The prerequisites for acceptance into the major are the sophomore review, which is an intensive advising session and evaluation of work from studio courses taken at the Yale School of Art, and five introductory courses (courses numbered 0001–1999). Four of the introductory courses must have been completed at the time of the sophomore review. Visual Thinking (ART 1111) and Basic Drawing (ART 1514) are mandatory, and may not be waived. At the time of the review, the student should be enrolled in the fifth

1000-level prerequisite course. In exceptional cases, arrangements for a special review during the junior year may be made with the DUS.

REQUIREMENTS OF THE MAJOR

The Art major requires fourteen courses, including the following: (1) five prerequisite courses at the Introductory level numbered 0001–1999 (including ART 1111 and ART 1514); (2) four courses at the 2000-level or above; (3) the Junior Seminar (ART 3995); (4) the two-term senior project (ART 4995 and ART 4996); and (5) two courses in the history of art, or DUS-approved equivalent. A student who has completed five courses numbered 0001–1999 may count a sixth such course towards the 2000-level course requirement. Program guidelines and specific requirements for the various areas of concentration are described below.

Areas of concentration Each Art major selects an area of concentration from five possible choices: (1) graphic design, (2) painting/printmaking, (3) photography, (4) sculpture, and (5) filmmaking. Suggested courses for the *graphic design concentration* are: ART 1732, 2764, 2765, 2766 or 3768; ART 3769 or 3770; and ART 4768 or 4769. Specific courses recommended for the *painting/printmaking concentration* are ART 1516, 1530, 3531 or 3532; ART 2524, 2545 or 3556; and ART 4514, 4532, 4533 or 4557. Students in the *photography concentration* should take ART 1836 and/or 1838; ART 2837 and/or 2839; ART 3837 or 3838; ART 3879 and 4801. The *sculpture concentration* recommends 2 of the following: ART 1610, 1620, 1621, 1621 or 1623; and 3 of the following: ART 2610, 3646, 3648, ART 3771 or 4646. Required courses for the *filmmaking concentration* are ART 1942, 3941, 3942, and ART 4942 or 4943. Students in the filmmaking concentration may substitute two non-production courses in Film and Media Studies for the history of art requirement, and the same for other concentrations only with permission of the DUS. Students wishing to work interdisciplinarily should consult with the DUS.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The senior requirement consists of a two-term senior project, ART 4995 and ART 4996.

UNIQUE TO THE MAJOR

Summer fellowship Art majors are eligible to apply for the Ellen Battell Stoeckel Fellowship for study at the Yale University Summer School of Music and Art in Norfolk, Connecticut. Applicants for the program must be officially classified as junior Art majors and be returning to Yale for two terms of their senior year. The program awards up to three course credits for work successfully completed. These credits may be used toward the requirements of the Art major at the discretion of the DUS.

Repeated and outside courses Some Art courses may be repeated for credit, with permission of both the instructor and the DUS. Course credits in studio art earned at other institutions may, in some cases, be applied toward the requirements of the major,

but not to replace the two prerequisites, and is done solely at the discretion of the DUS and subject to a faculty review process.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites Favorable faculty review of work done in studio courses before end of sophomore year; ART 1111 and 1514; 3 addtl courses numbered 0001–1999

Number of courses 14 courses (incl prereqs and yearlong senior project)

Specific courses required *All concentrations*—ART 3995; *Graphic design*—ART 1732, 2764, 2765, 2766 or 3768; ART 3769 or 3770; and ART 4768 or 4769; *Painting/printmaking*—ART 1516, 1530, 3531 or 3532; ART 2524, 2545 or 3556; and ART 4514, 4532, 4533 or 4557; *Photography*—ART 1836 and/or 1838; ART 2837 and/or 2839; ART 3837 or 3838; ART 3879, 4801; *Sculpture*—any 2 of ART 1610, 1620, 1621, 1622 or 1623; and any 3 of ART 2610, 3646, 3648, ART 3771, or 4646; *Filmmaking*—ART 1942, 3941, 3942; ART 4942 or 4943

Distribution of courses 4 courses at 2000-level or above; 2 courses in hist of art

Senior requirement Two-term senior project (ART 4995, 4996)

Substitution permitted *Filmmaking concentration*—2 courses in Film and Media Studies may be substituted for the hist of art req

MEMBERS OF THE SCHOOL OF ART TEACHING IN YALE COLLEGE

Professor Martin Kersels

Associate Professor Meleko Mokgosi

Senior Critics Julian Bittiner, Sandra Burns, Alice Chung, Benjamin Donaldson, Pamela Hovland, Matthew Keegan, Lisa Kereszi, Sophy Naess, Christopher Pullman, A.L. Steiner, Sarah Stevens-Morling, Elizabeth Tubergen, Henk Van Assen

Critics Beverly Acha, Michel Auder, Yeju Choi, Rachelle Dang, Maria de Los Angeles, Neil Goldberg, Halsey Rodman, Karin Schneider, Douglass Scott, Alexander Valentine, Anahita Vossoughi, Molly Zuckerman-Hartung

Lecturers Jonathan Andrews, American Artist, Elena Bertozzi, Nathan Carter, Luiza Dale, Luchina Fisher, Ben Hagari, Shira Inbar, Hasabie Kidanu, Desmond Lewis, Jesse Marsolais, Rosa McElheny, Ted Partin, Michael Rader, Kern Samuel, Ryan Sluggett, Greg Parma Smith

Astronomy & Astrophysics

Director of undergraduate studies: Jeff Kenney (jeff.kenney@yale.edu); astronomy.yale.edu

Astronomy and Astrophysics are quantitative physical sciences that apply physics, mathematics, and statistical analysis to observing, describing, and modeling the universe. The courses and degree programs offered by the Department of Astronomy train students in research techniques and quantitative reasoning and develop creative problem solvers. The department offers a B.A. degree in Astronomy and a B.S. degree in Astrophysics. The Astronomy degree is intended for students who plan to continue in adjacent fields such as science policy and science journalism. The Astrophysics degree is intended for students who plan to attend graduate school in related fields. Students who complete either major are sought after by employers in a range of fields from healthcare management to the banking and investment industry.

INTRODUCTORY COURSES

Introductory courses with no prerequisites The department offers a variety of courses without prerequisites that provide an introduction to astronomy with particular attention to recent discoveries and theories. Courses numbered below 1500 are intended for students who desire a broad, nontechnical introduction to astronomy. These courses fulfill the science distributional requirement, and some also fulfill the quantitative reasoning distributional requirement.

Courses with numbers from 1500 to 1999 are topical rather than survey courses. Most of these offerings fulfill both the science and the quantitative reasoning requirements. ASTR 1550 is a laboratory course that provides a hands-on introduction to astronomical observing. ASTR 1600 and ASTR 1700 provide an introduction to frontier topics in modern astrophysics and cosmology.

Introductory courses with high school calculus and physics prerequisites Students who have taken calculus and physics in high school may enroll in quantitative introductory courses. ASTR 2100 and ASTR 2200 focus on fundamental measurements and tools used in astronomy and include an in-depth study of stellar astrophysics (ASTR 2100) or galaxies and cosmology (ASTR 2200). These courses overlap in content, so students should take either ASTR 2100 or ASTR 2200, but not both. ASTR 2550 provides training in data analysis and research techniques, including computer programming and numerical and statistical analysis.

PREREQUISITES

B.A. degree program The prerequisites for the B.A. degree are PHYS 1700 and PHYS 1710, or PHYS 1800 and PHYS 1810, or PHYS 2000 and PHYS 2010, and MATH 1120 and 1150.

B.S. degree program Prerequisites for the B.S. degree include an introductory physics sequence (PHYS 1800 and PHYS 1810, or PHYS 2000 and PHYS 2010, or PHYS 2600 and PHYS 2610); a physics laboratory sequence (PHYS 1650L and PHYS 1660L, or PHYS 2050L and PHYS 2060L); and the mathematics sequence MATH 1120, MATH 1150, and either MATH 1200 or ENAS 1510. ASTR 1550 may be substituted for

one term of the physics laboratory sequence. All prerequisites should be completed by the end of the sophomore year.

Prerequisites for advanced electives Courses numbered 3000 and above are specialized and intensive. The prerequisites for these courses include ASTR 2100 or ASTR 2200, multivariable calculus, and two terms of introductory college physics.

REQUIREMENTS OF THE MAJOR

B.A. degree program The B.A. degree program in Astronomy is designed for students who do not plan to continue in a graduate program in astronomy, but who are interested in the subject as a basis for a liberal arts education or as a physical science background to careers such as medicine, teaching, journalism, business, law, or government. It allows greater flexibility in course selection than the B.S. program because the emphasis is on breadth of knowledge rather than on specialization.

Ten courses are required beyond the prerequisites, including either ASTR 2100 or 2200; ASTR 2550; ASTR 3100; one additional Astronomy elective numbered 1500 or above; and the senior requirement (ASTR 4920). Two of the ten courses must be advanced courses in mathematics, such as MATH 1200 or ENAS 1510, or courses in mathematical methods, including statistics or computer science, such as CPSC 1001, MATH 2000 or above, or ASTR 3560. Three electives can be drawn from any of the natural, applied, or mathematical sciences (including additional astronomy courses); at least two of these must be advanced enough to have college-level prerequisites.

B.S. degree program The B.S. degree program in Astrophysics is designed to provide a strong foundation in astrophysics for students interested in graduate study or a career in astronomy, physics, or a related science.

Beyond the prerequisites, twelve courses are required in astronomy, physics, and mathematics. Students complete at least six courses in astronomy, including either ASTR 2100 or 2200; ASTR 2550; ASTR 3100; ASTR 3200; and a two-term senior project (ASTR 4900 and 4910). Students also complete three physics courses numbered 4000 or above, normally PHYS 4010, PHYS 4020, and PHYS 4390. In addition, majors choose either one additional 4000-level course in physics or an astronomy elective numbered 3000 or higher. In mathematics, students complete a course in differential equations selected from MATH 2460, PHYS 4000, or ENAS 1940, and either an additional mathematics course numbered 2000 or above or a course in statistics or computing such as CPSC 1001, CPSC 2010, or ASTR 3560.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the major requirements of either degree program.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

B.A. degree program The senior requirement consists of a senior essay or independent research project carried out for one term in ASTR 4920 under the supervision of a faculty member.

B.S. degree program The senior requirement consists of an independent research project in astronomy carried out for two terms in ASTR 4900 and ASTR 4910 under the supervision of a faculty member.

ADVISING

Before entering the junior year, students must obtain approval of a course of study from the director of undergraduate studies (DUS).

Graduate work Graduate courses in astronomy are open to qualified undergraduates who already have a strong preparation in mathematics, physics, and astronomy. Students wishing to take a graduate course must first obtain the permission of the instructor and of the director of graduate studies.

SUMMARY OF MAJOR REQUIREMENTS

ASTRONOMY, B.A.

Prerequisites PHYS 1700, PHYS 1710, or PHYS 1800, PHYS 1810, or PHYS 2000, PHYS 2010; MATH 1120, MATH 1150

Number of courses 10 courses beyond prereqs, incl senior req

Specific courses required ASTR 2100 or ASTR 2200; ASTR 2550; ASTR 3100

Distribution of courses 1 astronomy elective numbered 1500 or above; 2 advanced math courses; 3 science electives (may include addtl astronomy courses), at least 2 with college-level prereqs

Senior requirement Senior essay or senior research project (ASTR 4920)

ASTROPHYSICS, B.S.

Prerequisites PHYS 1800, PHYS 1810, or PHYS 2000, PHYS 2010, or PHYS 2600, PHYS 2610; PHYS 1650L, PHYS 1660L, or PHYS 2050L, PHYS 2060L; MATH 1120, MATH 1150; MATH 1200 or ENAS 1510

Number of courses 12 courses beyond prereqs, incl senior req

Specific courses required ASTR 2100 or 2200; ASTR 2550; ASTR 3100; ASTR 3200

Distribution of courses 3 courses in physics numbered 4000 or above; 1 addtl course in astronomy numbered 3000 or above or in physics numbered 4000 or above; 2 courses in math or mathematical methods, as specified

Substitution permitted ASTR 1550 for 1 term of physics lab prereq

Senior requirement Senior independent research project (ASTR 4900 and ASTR 4910)

FACULTY OF THE DEPARTMENT OF ASTRONOMY

Professors Hector Arce, Charles Bailyn, †Charles Baltay, Sarbani Basu (*Chair*), Paolo Coppi, Pierre Demarque (*Emeritus*), Debra Fischer, Marla Geha, Jeffrey Kenney, Richard Larson (*Emeritus*), Priyamvada Natarajan, †C. Megan Urry, William van Altena (*Emeritus*), Frank van den Bosch, Pieter van Dokkum, Robert Zinn

Associate Professors †Daisuke Nagai, †Nikhil Padmanabhan

Assistant Professors Earl Bellinger, Malena Rice

Lecturer Michael Faison

†A joint appointment with primary affiliation in another department.

Biology

Program coordinators: Edgar Benavides (edgar.benavides@yale.edu) and Thomas Loreng (thomas.loreng@yale.edu)

Yale offers four biological science majors: Ecology and Evolutionary Biology (E&EB); Molecular Biophysics and Biochemistry (MB&B); Molecular, Cellular, and Developmental Biology (MCDB); and Neuroscience (NSCI). The distinctions between these majors reflect the types of biological systems analysis each represents: the analysis of whole organisms, populations, and ecosystems (E&EB); the analysis of life at the molecular level using tools of chemistry and physics (MB&B); the analysis of molecular, cellular, and developmental biology, genetics, neurobiology, and quantitative biology (MCDB); and the analysis of neurons, neural circuits, brains, and behavior, using a wide range of approaches (NSCI). Yale also offers the Biomedical Engineering (BENG) major for students interested in studying biological systems from the perspectives of the physical sciences and engineering.

Together, these approaches cover the vast breadth of disciplines in the biological sciences. The courses BIOL 1010–1040 are designed as entry points to all four programs. The prerequisites for the four majors are similar, so students need not commit to a specific major in their first year. Students who wish to major in any of the four tracks (E&EB, MB&B, MCDB, and NSCI) must complete all four modules.

For information on the major requirements, course offerings, and departmental faculty of the biological sciences programs, see Ecology and Evolutionary Biology; Molecular Biophysics and Biochemistry; Molecular, Cellular, and Developmental Biology; and Neuroscience. See also information for Biomechanical Engineering.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the biological sciences majors listed above, except with permission of the DUS.

Biomedical Engineering

Director of undergraduate studies: Lawrence H. Staib (lawrence.staib@yale.edu), N309 B TAC, 785-5958; seas.yale.edu/departments/biomedical-engineering

Engineering methods and strategies are used to address biomedical problems ranging from studies of physiological function using images to the development of novel drug delivery methods and new biomaterials. The B.S. degree in Biomedical Engineering is designed to provide students with an understanding of common fundamental methodologies in biomedical engineering and the ability to develop quantitative approaches to one of four biomedical engineering concentrations: Bioimaging, Biomechanics and Mechanobiology, Biomolecular Engineering, and Systems Biology. The course structure of the major permits students to bridge basic concepts in the life sciences and traditional areas of engineering, while gaining a comprehensive understanding of biomedical engineering as a field of study. The program provides graduates with an excellent background for graduate study in biomedical engineering and related areas, or in medicine and other health professions as well as for a diverse range of careers in industry, consulting, or government.

PREREQUISITES

The following prerequisites are common to all concentrations in the major: BIOL 1010 and 1020 or a higher-level course in MCDB or MB&B, with the permission of the director of undergraduate studies (DUS); a lecture course in chemistry numbered CHEM 1610 or higher; MATH 1150 or MATH 1160 (not necessary if placed into MATH 1200 or ENAS 1510); MATH 1200 or ENAS 1510; ENAS 1940; PHYS 1800, 1810 and PHYS 2050L, 2060L or PHYS 1650L, 1660L. Advanced high school preparation does not bypass these prerequisites; instead, students move ahead to more advanced courses with DUS permission.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Biomedical Engineering major requirements.

Students must complete thirteen term courses, totaling at least eleven course credits, beyond the prerequisites, including at least three required courses in the chosen concentration and the senior requirement (see below). During the first two years, students study basic biology, chemistry, mathematics, and physics (see prerequisites). By the end of the sophomore year, students should have taken BENG 2080, 2800, and 3200. In the junior year, students gain a comprehensive grounding in the field through BENG 3600, 3400, 3500, 3100, and 3110. During the junior and senior years, students acquire depth by taking electives in one of the four concentrations. One relevant course (e.g. MB&B 3000) may be substituted with DUS permission. A senior seminar (BENG 4080) provides information about the field and a senior project (BENG 4974 or BENG 4973, 4974) allows students to explore an area in depth.

Students in all concentrations are required to take the following courses: BENG 2800, 2080, 3200, 3600, 3400, 3500, 3100, 3110, and 4080.

Students in the *Bioimaging concentration* (YC BENG Bioimaging) must also take three courses chosen from, e.g., BENG 4104, 4106, 4410, 4440, 4450, 4849, 4475, 4476, or 4485.

Students in the *Biomechanics and Mechanobiology concentration* (YC BENG Biomchncs&Mchnbiology) must also take three courses chosen from, e.g., MENG 1105, 3422, BENG 4104, 4106, 4410, 4622, 4560, or 4580.

Students in either the Biomolecular Engineering concentration (YC BENG Biomolecular Engrng) or the ***Systems Biology concentration*** (YC BENG Systems Biology) must also take three courses chosen from, e.g., BENG 4104, 4106, 4410, 4611, 4622, 4350, 4630, 4261, 4767, 4680, 4690, MENG 3422.

Research courses Students are permitted and encouraged to engage in research before the senior year by enrolling in BENG 4971 and/or BENG 4972. These courses, offered Pass/Fail, may be taken more than once for credit.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

In their sophomore year, all students must enroll in BENG 2080 and in their senior year, all students must enroll in BENG 4080; both are half-credit courses. They must also complete a one-term senior project in their final term of enrollment (BENG 4974) or a two-term, yearlong project (BENG 4973, 4974).

ADVISING

Preparation for graduate study The Biomedical Engineering curriculum is excellent preparation for graduate study in engineering, science, and medicine.

Combined B.S./M.S. degree program Exceptionally able and well-prepared students may apply to complete a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in Biomedical Engineering.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites BIOL 1010 and BIOL 1020, or higher-level course in MCDB or MB&B with DUS permission; 1 lecture course in chemistry numbered CHEM 1610 or higher; ENAS 1940; MATH 1150 or MATH 1160 (not necessary if placed into MATH 1200 or ENAS 1510); MATH 1200 or ENAS 1510; PHYS 1800, 1810 and PHYS 2050L, 2060L or PHYS 1650L, 1660L.

Number of courses 13 term courses, totaling at least 11 course credits, beyond prerequisites (incl senior req)

Specific courses required *All concentrations*—BENG 2800, 2080, 3200, 3600, 3400, 3500, 3100, 3110, 4080

Distribution of courses *All concentrations*—3 courses from one of four concentrations; see above for suggested courses for each concentration

Substitution permitted Relevant course with DUS permission

Senior requirement BENG 2080, a half-credit course taken sophomore year**;** BENG 4080, a half-credit course taken senior year; a one-term senior project in final term of enrollment (BENG 4974) or two-term, yearlong senior project (BENG 4973 and 4974)

FACULTY OF THE DEPARTMENT OF BIOMEDICAL ENGINEERING

Professors †Helene Beneviste, †Joerg Bewersdorf, Richard Carson, †Nicholas Christakis, †Todd Constable, †Robin de Graaf, James Duncan, Rong Fan, †Henry Hsia, Jay Humphrey, Fahmeed Hyder, Themis Kyriakides, †Francis Lee, Andre Levchenko, †Graeme Mason, †Evan Morris, †Xenophon Papademetris, Douglas Rothman, Mark Saltzman, †Martin Schwartz, †Frederick Sigworth, †Albert Sinusas, †Brian Smith, Lawrence Staib, †Hemant Tagare, †Paul Van Tassel, Steven Zucker

Associate Professors Stuart Campbell, Tarek Famy, †Gigi Galiana, Anjelica Gonzalez, †Michelle Hampson, Farren Isaacs, †Chi Liu, Kathryn Miller-Jensen, Michael Murrell, †Dana Peters, †Dustin Scheinost, †Jiangbing Zhou

Assistant Professors †Daniel Coman, †Nicha Dvornek, †Ansel Hillmer, Michael Mak, Christina Rodriquez, Gregory Tietjen, †Daniel Wiznia

Research Scientist †Steven Tommasini

Lecturers †Liqiong Gui, †Jing Zhou

†A joint appointment with primary affiliation in another department or school.

British Studies

(Courses at the Paul Mellon Centre in London)

Director of undergraduate studies: Jemma Field (jemma.field@yale.edu)

The Yale in London study abroad program is run by the Yale Center for British Art (YCBA) and Yale's Paul Mellon Centre for Studies in British Art (PMC)—a world-class research center in central London. This program is an exciting opportunity for undergraduates to take interdisciplinary Yale courses abroad to explore the arts, politics and culture in Britain, and through its diasporic and global histories.

All students who participate in the program are expected to enroll full-time, which the program defines as four courses in the spring and two courses in the summer. There are no prerequisites and students from any major and from any year of study may apply. All courses carry full Yale College credit. Students may elect to take up to two courses Credit/D/Fail during the spring term, but they must enroll in at least two courses, representing at least two course credits, for a letter grade as indicated in Section B, Grades in the Academic Regulations.

Yale University professors and world-leading academics, writers, and thinkers from the UK teach courses seminar-style. Courses are experiential and designed to ensure a significant amount of time is spent learning outside of the classroom. Day trips, visits to museums/sites/organizations, and guest speakers are a key part of their delivery.

Further information on housing, fees, financial aid, and student life is available on the program website. Inquiries about the program, described under "International Experience" in The Undergraduate Curriculum, may be directed to yaleinlondon@yale.edu.

The application deadline for the spring term is in October and the application deadline for the summer program is in March. See the Yale in London website for exact deadlines. Students are notified of acceptance within one month of the application deadline.

Chemical Engineering

Director of undergraduate studies: Paul Van Tassel (paul.vantassel@yale.edu); seas.yale.edu/departments/chemical-and-environmental-engineering

Energy, the environment, and health care are key challenges facing humanity in the twenty-first century. Chemical engineering is a discipline well placed to confront these challenges. Chemical engineering is rooted in the basic sciences of mathematics, chemistry, physics, and biology; a traditional engineering science core of thermodynamics, transport phenomena, and chemical kinetics; a rigorous design component; and an expanding focus on emerging topics in materials, nanotechnology, and life sciences. The discipline has grown from its petrochemical origins to become central to state-of-the-art technologies in microelectronics, alternative energy, biomedicine, and pharmaceutics.

The Chemical Engineering program, with two degree programs (see below), is principally focused on basic and engineering sciences and on problem solving. Additional emphasis is on communication, analysis of experiments, and chemical process design. A special feature of the program is the accessibility of laboratory research—most chemical engineering majors participate in faculty-led research projects, often resulting in publication and/or presentation at national meetings.

Chemical engineering graduates find a wide range of professional opportunities in academia, industry, government, business, and the nonprofit sector. Many majors go on to graduate programs in chemical, biomedical, or environmental engineering, or to medical, law, or business schools.

Upon graduation, Yale's Chemical Engineering students are expected to have achieved "Student Outcomes" as defined by ABET (www.abet.org) and the program. The Chemical Engineering major produces graduates who demonstrate: (1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics; (2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors; (3) an ability to communicate effectively with a range of audiences; (4) an ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts; (5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives; (6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; and (7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Yale and ABET also look ahead, several years beyond graduation. Program educational objectives provide the expectations for graduates early in their career. The Chemical Engineering objectives are to produce graduates who: (1) have mastery of the basic principles of science and modern chemical engineering practice and are able to adapt and creatively apply them to solve new problems in a broad range of fields; (2) become ethical professionals who advance chemical engineering practice and knowledge in

multiple fields and recognize the local and global impacts of their work on humans and the environment; (3) are able to work well with people from diverse backgrounds and are committed to the advancement of women and under-represented groups in engineering; (4) have a strong educational foundation enabling them to study in graduate and professional schools as well as become leaders in STEM or non-STEM career paths; and (5) are committed to, and engage in, lifelong learning throughout their careers.

PREREQUISITES

Students considering a Chemical Engineering major are encouraged to take two terms of chemistry and mathematics during the first year, and to contact the director of undergraduate studies (DUS).

Students in both degree programs (see below) take the following prerequisite courses: MATH 1120, 1150, and ENAS 1510 or MATH 1200; CHEM 1610 and 1650 or CHEM 1630 and 1670; CHEM 1340L and 1360L; PHYS 1800, 1810 or PHYS 2000, 2010 or PHYS 2600. Students with advanced high school preparation may reduce the number of prerequisites by placing out of certain courses.

REQUIREMENTS OF THE MAJOR

Two degree programs are offered: a B.S. in Chemical Engineering accredited by the Engineering Accreditation Commission of ABET, Inc., and a B.S. in Engineering Sciences (Chemical). All students majoring in Chemical Engineering and Engineering Sciences (Chemical) must follow the requirements listed below as approved by the program's faculty.

B.S. degree program in Chemical Engineering The curriculum for the ABET-accredited B.S. degree in Chemical Engineering requires 19 courses, totaling 18.5 credits, including the senior requirement (CENG 4160), and the following courses beyond the prerequisites:

1. Computing: ENAS 1300 or CPSC 1001 or CPSC 2000
2. Mathematics: ENAS 1940
3. Chemistry: CHEM 1740 or CHEM 2200; CHEM 2220L; CHEM 3320 and 3330
4. Engineering: Four term courses chosen from engineering electives
5. Chemical engineering: CENG 1500 or CENG 2100; CENG 3000, 3010, 3140 (or MENG 3422), CENG 3150, 4110, 4120L, 4800

B.S. degree program in Engineering Sciences (Chemical) The B.S. degree in Engineering Sciences (Chemical) requires 12 term courses for 12 credits, including the senior requirement, CENG 4160 or CENG 4900, and the following courses beyond the prerequisites, chosen in consultation with the DUS:

1. Computing: ENAS 1300 or CPSC 1001 or CPSC 2000
2. Mathematics: ENAS 1940
3. Chemistry: CHEM 1740 or CHEM 2200; and CHEM 3320
4. Engineering: One term course chosen from engineering electives
5. Chemical engineering: CENG 1500 or CENG 2100; CENG 3000, 3010, 3140 (or MENG 3422), CENG 3150, 4110

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major. The DUS may consider requests under special circumstances.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

B.S. degree program in Chemical Engineering In their senior year, students must complete a senior research project in CENG 4160.

B.S. degree program in Engineering Sciences (Chemical) In their senior year, students must complete a senior research project in CENG 4160 or CENG 4900.

SUMMARY OF MAJOR REQUIREMENTS

CHEMICAL ENGINEERING, B.S.

Prerequisites MATH 1120, 1150; ENAS 1510 or MATH 1200; CHEM 1610 and 1650 or CHEM 1630 and 1670; CHEM 1340L and 1360L; PHYS 1800, 1810 or PHYS 2000, 2010 or PHYS 2600.

Number of courses 19 courses, totaling 18.5 credits, beyond prereqs (incl senior req)

Specific courses required ENAS 1940; CHEM 1740 or CHEM 2200; CHEM 2220L; CHEM 3320, 3330; CENG 1500 or CENG 2100; CENG 3000, 3010, 3140 (or MENG 3422), CENG 3150, 4110, 4120L, 4800

Distribution of courses 1 from ENAS 1300, CPSC 1001, or 2000; 4 addtl electives in engineering

Senior requirement CENG 4160

ENGINEERING SCIENCES (CHEMICAL), B.S.

Prerequisites MATH 1120, 1150; ENAS 1510 or MATH 1200; CHEM 1610 and 1650 or CHEM 1630 and 1670; CHEM 1340L and 1360L; PHYS 1800, 1810 or PHYS 2000, 2010 or PHYS 2600.

Number of courses 12 term courses for 12 credits beyond prereqs (incl senior req), chosen in consultation with DUS

Specific courses required ENAS 1940; CENG 1500 or CENG 2100; CENG 3000, 3010, 3140 (or MENG 3422), CENG 3150, 4110

Distribution of courses 1 from ENAS 1300, CPSC 1001, or 2000; CHEM 1740 or CHEM 2200; CHEM 3320; 1 engineering elective

Senior requirement CENG 4160 or CENG 4900

FACULTY OF THE DEPARTMENT OF CHEMICAL AND ENVIRONMENTAL ENGINEERING

Professors Eric Altman, †Paul Anastas, †Michelle Bell, †Ruth Blake, Menachem Elimelech, John Fortner, Gary Haller (*Emeritus*), †Edward Kaplan, Jaehong Kim, Michael Loewenberg, †Andrew Miranker, Jordan Peccia, Lisa Pfefferle, Daniel Rosner

(*Emeritus*), †Mark Saltzman, †Udo Schwarz, T. Kyle Vanderlick, Paul Van Tassel, Julie Zimmerman

Associate Professors Drew Gentner, Mingjiang Zhong

Assistant Professors Peijun Guo, Amir Haji-Akbari, †Shu Hu, Lea Winter

Lecturers †Anikó Bezur, †Paul Whitmore

†A joint appointment with primary affiliation in another department or school.

Chemistry

Director of undergraduate studies: Sarah Slavoff (sarah.slavoff@yale.edu); chem.yale.edu

The wide range of courses offered by the Department of Chemistry reflects the position of chemistry as the foundation of all the molecular sciences. In addition to graduate work in chemistry, biochemistry, or health-related disciplines, the department's graduates find their broad scientific training useful in fields such as technology policy, business management, and law. Chemistry is an especially appropriate major for students interested in energy research or policy and the environment.

COURSES FOR NONMAJORS WITHOUT PREREQUISITES

The Chemistry department offers one-term courses with no prerequisites, which are intended for non–science majors. These courses do not satisfy medical school requirements or the general chemistry requirement for any science major. Courses for nonmajors are numbered CHEM 1000–1090.

PREREQUISITES AND INTRODUCTORY COURSES

Prerequisite courses Required prerequisites for the Chemistry degree programs are: two terms of general chemistry and laboratory; single-variable calculus at the level of MATH 1150 or MATH 1160; and one term of introductory physics numbered 1700 or higher, or advanced placement beyond these levels in math or physics. Students also are encouraged to complete a course in multivariable calculus (MATH 1200, MATH 1210, or ENAS 1510); these courses or more advanced math courses fulfill the math prerequisite. All prerequisite courses must be taken for a letter grade; if they are taken as Audit or Credit/D/Fail they will not satisfy the requirement.

Introductory courses The majority of students begin with the general chemistry sequence CHEM 1610 and 1650 or with CHEM 1700 (note: the general chemistry sequence CHEM 1630 and 1670 is not offered AY 2025-2026). These courses fulfill the prerequisite for general chemistry in the Chemistry major. Students taking CHEM 1610 may be studying chemistry for the first time, perhaps took chemistry as a high school sophomore, or even may have completed AP chemistry but did not fully master the subject at that level. Students in CHEM 1700 have completed a year or two of chemistry later in high school, although motivated students may have last taken chemistry as a high-school sophomore if they have a strong math and physics background. Typically students who complete CHEM 1700 in the fall term complete Organic Chemistry (CHEM 2200 and CHEM 2220L) in the spring term. Regardless of whether a student completes the CHEM 1610 and 1650 sequence or CHEM 1700, the introductory laboratory sequence is CHEM 1340L, 1360L, or CHEM 1710L; each laboratory course is worth one-half course credit.

Students with a sufficiently strong background in chemistry may initiate their studies with courses in organic or physical chemistry after demonstrating proficiency on the department's placement examination. While CHEM 1740 and 1750 are offered only to first-year students, other courses in organic chemistry, including CHEM 2200 and 2210, also are available to qualified first-year students. Students with a strong background in physics and calculus may be eligible for the physical chemistry courses

CHEM 3320 and 3330 in the first year if they have fulfilled the math and physics requirements.

PLACEMENT PROCEDURES

Details about placement and preregistration for chemistry courses can be found on the department website. Information about the different degree programs, advising, and undergraduate research also are available on the department website.

Permission Enrollment in CHEM 1700 or CHEM 1740 through the registration system requires permission from the department. Permission is issued automatically after placement has been completed for entering first-year students. For more information email chemistry.dus@yale.edu.

Upper-level students Upper-level students wishing to take CHEM 1610 or 1630 (note, CHEM 1630 is not offered AY 2025-2026) should confirm their placement on Canvas@Yale by accessing the Chemistry Placement site that corresponds to their year of matriculation. If permission is required in the registration system, upper-level students should write to chemistry.dus@yale.edu. Those wishing to enroll in CHEM 2200 may do so as long as they have satisfied the general chemistry prerequisite.

Section registration in laboratory and lecture courses Information about online registration for laboratory and discussion sections can be found in the description for each laboratory or lecture course in Yale Course Search.

Advanced courses All chemistry advanced lecture courses numbered 4000 and higher are half-semester courses and count for one-half Yale College credits. These courses are held in the first half of the semester or in the second half of the semester. Information about the timing of courses is available in Yale Course Search. Because most advanced courses are offered either in the fall term or have a fall-term course as a prerequisite, students should give consideration to the advanced courses they plan to take in the spring term. For the purpose of degree requirements, all undergraduate Chemistry courses numbered 4010 or higher, approved by the director of undergraduate studies (DUS), typically count as advanced lecture or laboratory courses, as do CHEM 2260L, 2510L, 3310L, 3490L, 3550L, and 3350L. Many graduate-level Chemistry courses (those numbered 5000 and above) also may count toward the advanced-course requirement; consult the DUS for information about eligible courses.

For premedical students Medical schools currently require one year of organic chemistry and laboratory as well as one year of general chemistry and laboratory. The general chemistry requirement may be satisfied by completing CHEM 1610 and 1650, CHEM 1700 (CHEM 1630 and 1670 are not offered AY 2025-2026), or two terms of physical chemistry. Students should consult with the Office of Career Strategy for the most up-to-date premedical course advice.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Chemistry major requirements.

Four degree programs are offered: the B.A., the B.S., an intensive major leading to the B.S., and the combined B.S./M.S. The B.A. degree is intended for students who want solid training in the chemical sciences and who also intend to study other subjects in which chemical training would be an asset, such as technology policy, economics, or the

environment. The B.S. degree is intended to prepare students for graduate study while permitting extensive exploration of other disciplines and is also recommended for those planning to attend graduate school. The B.S. degree with an intensive major provides more focused preparation for a career in chemical research, and requires greater breadth in laboratory courses and electives. The combined B.S./M.S. is designed for students whose advanced preparation qualifies them for graduate-level work in their third and fourth years of college.

The major requires a group of prerequisites or their equivalent in advanced placement, a core of courses common to all four degree programs, advanced courses specific to each degree program, and a senior requirement.

Course requirements common to all Chemistry degree programs All degrees require the following 5 credits with two terms of organic chemistry (CHEM 1740 or 2200, and CHEM 1750, or 2210, or CHEM 2300) with laboratory (CHEM 2220L and 2230L), one term of physical chemistry (CHEM 3320 or 3280), and one term of inorganic chemistry (CHEM 2520).

B.A. degree program The B.A. degree program requires ten course credits beyond the prerequisites. In addition to the common degree requirements and one-term senior requirement, the B.A. degree requires four additional course credits of advanced chemistry lecture or laboratory courses. At least one full credit must be attained through advanced lecture courses in the Chemistry department and at least one must be a Chemistry laboratory course. CHEM 3330 may be counted toward the advanced-course requirement, although not as the sole lecture course.

B.S. degree program The B.S. degree program requires thirteen course credits beyond the prerequisites. In addition to the common degree requirements and two-term senior requirement, the B.S. degree requires completion of a second term of physical chemistry (CHEM 3330), one term of physical chemistry laboratory (CHEM 3300L), and four additional course credits of advanced chemistry lecture or laboratory courses. At least one full credit must be attained through advanced lecture courses in the Chemistry department and at least one must be a Chemistry laboratory course.

B.S. degree program, intensive major The B.S. degree program, intensive major requires fifteen course credits beyond the prerequisites. In addition to the common degree requirements and two-term senior requirement, the B.S. degree with an intensive major requires completion of a second term of introductory physics numbered 1700 or higher, a second term of physical chemistry (CHEM 3330), one term of physical chemistry laboratory (CHEM 3300L), and five additional course credits of advanced chemistry lecture or laboratory courses. At least two full credits must be attained through advanced lecture courses in the Chemistry department and at least one must be a Chemistry laboratory course.

Combined B.S./M.S. degree Exceptionally well-prepared students may complete a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. Formal application for admission to this program must be made no later than the last day of classes in the fifth term of enrollment. To be considered for admission, by the end of their fifth term applicants must have achieved at least two-thirds A or A– grades in all of their course credits as well as in all of the course credits directly relating to the major, including prerequisites. Two terms of

CHEM 4900 must be taken in the fifth and sixth terms with earned grades of A or A– to continue in the program. The B.S./M.S. degree program requires completion of the intensive major requirements, including the senior requirement, which typically is completed in the fifth and sixth terms. The introductory physics requirement must be fulfilled with PHYS 2000 and 2010 or PHYS 2600 and 2610; a term course in physics numbered 4000 or higher and approved by the Chemistry DUS may be substituted for the introductory sequence. In addition, eight credits of graduate courses in chemistry (four of which count toward the B.S.) are required. Four terms of research are required, including two terms of research taken in CHEM 9900. Students in the program must earn grades of A in at least two of their graduate-level term courses (or in one yearlong course) and have at least a B average in other graduate-level courses. B.S./M.S. candidates also are expected to continue their independent research in a summer internship between their junior and senior years. At the end of their eighth semester students are required to write a thesis summarizing their research activities. The thesis must be written under the guidance of the faculty member who supervises the student's research and it must be submitted to their research adviser on the final day of classes of the student's eighth semester. The thesis should be no shorter than twenty-five pages (double-spaced, twelve-point font, excluding figures, tables, and bibliography) and normally should contain the following sections: Introduction, Results and Discussion, Summary and Conclusions, Research Methods, and Bibliography. Students in the B.S./M.S. program, must also present their research in the form of a poster presentation at the end of their sixth semester (to fulfill the requirements of the B.S. degree) and an oral presentation at the end of their eighth semester (to fulfill the requirements of the M.S. degree). Both the poster and oral presentation are coordinated by the instructor of CHEM 4900. For more information, see Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees."

Credit/D/Fail No chemistry course taken Credit/D/Fail may be applied toward the requirements of the major (including substitutions for advanced courses). No prerequisites taken Credit/D/Fail may be applied toward the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

For the B.A. degree program Students in the B.A. degree program must complete the senior seminar CHEM 4000, in which they prepare a capstone essay on a chemistry-related topic. The capstone essay is expected to be 15–25 pages in length (double-spaced, twelve-point font, exclusive of figures, tables, and bibliography).

For the B.S. degree program Students in the B.S. degree program may fulfill the senior requirement by completing two terms of the independent research course CHEM 4900 and writing a capstone report under the guidance of a faculty member that describes their research activities. Alternatively, they may complete the senior seminar CHEM 4000, in which they prepare a capstone essay on a chemistry-related topic, and complete one additional course credit of advanced chemistry lecture or laboratory course or CHEM 4900. The capstone report or essay is expected to be 15–25 pages in length (double-spaced, twelve-point font, exclusive of figures, tables, and

bibliography). All students performing research also must present their work in the form of an oral or poster presentation as coordinated by the instructor of CHEM 4900.

For the B.S. degree program with an intensive major Students in the B.S. degree program with an intensive major fulfill the senior requirement by completing two terms of the independent research course CHEM 4900 and writing a capstone report of 15–25 pages in length (double-spaced, twelve-point font, exclusive of figures, tables, and bibliography) under the guidance of a faculty member that describes their research activities. Students in the intensive major program also must present their work in the form of an oral or poster presentation as coordinated by the instructor of CHEM 4900.

ADVISING

Majors are encouraged to begin their programs in the first year to provide the greatest flexibility in scheduling. It is possible, however, to complete the B.S. in as few as six terms if a student has advanced placement. One sample B.S. program follows, but many others are possible:

First-Year	Sophomore	Junior	Senior
CHEM 1610, 1650, 1340L, 1360L, math prereq	CHEM 2200, 2210, 2520, 2220L, 2230L, physics prereq	CHEM 3320, 3330, 3300L, 2510L, 1 elective (1 credit)	2 terms of CHEM 4900, 2 electives (2 credits)

Substitutions for required courses Up to two credits of advanced science courses outside Chemistry may be counted as electives, with the written approval of the DUS. CHEM 4900 may not in any circumstance be substituted for any of the laboratory requirements. The graduate courses CHEM 5620L, 5640L, and 5650L may not be counted toward any requirement of the major.

Programs of study with special emphasis The flexibility of the degree requirements makes it possible for a student's program of study to emphasize a particular area of specialization in chemistry. For example, a program specializing in chemical biology may include CHEM 4190 and biochemistry electives such as MB&B 3000 or 3010. An inorganic chemistry specialization could include CHEM 4020 and 4030. A program with emphasis in physical chemistry and chemical physics would have electives such as CHEM 4660, 4720, or 4960. Students interested in synthetic organic chemistry could complete electives such as CHEM 4160, 4230, or CHEM 5280. An emphasis in biophysical chemistry includes a course in either chemical biology or biochemistry, as well as electives chosen from graduate courses in biophysics or biochemistry. Students may design programs with other areas of emphasis in consultation with the DUS. For a list of graduate courses appropriate for a particular specialization, consult the DUS.

Approval of major programs of study All Chemistry majors in their sophomore, junior, and senior years must have their programs approved by the DUS. A program tailored to each student's goals is created and recorded on a Chemistry Course of Study (COS) form and submitted to chemistry.dus@yale.edu.

STUDY ABROAD

Chemistry majors wishing to study abroad typically find their course of study easier to schedule if the semester abroad is a spring term. Students studying abroad in the spring term of their junior year are required to obtain approval for the project that will fulfill their senior requirement before the end of the prior term. For general information

on the Year or Term Abroad, see Academic Regulations, section K, Special Academic Programs, "Year or Term Abroad."

UNIQUE TO THE MAJOR

Special restrictions on lecture courses For the general, organic, or physical chemistry sequences, CHEM 1610 and 1650; CHEM 1740 or 2200 and CHEM 1750, 2210, or CHEM 2300; and CHEM 3320 or CHEM 3280 and 3330, completion of the first term with a passing grade is a prerequisite for registration in the subsequent term. Completion of CHEM 1700 with a passing grade is a prerequisite for registration in CHEM 2200.

Students receive credit for only one chemistry sequence of any given type. For example, a student who has completed CHEM 1700 may not subsequently enroll in CHEM 1610 or CHEM 1650; a student who has completed CHEM 1740 and 1750 may not subsequently enroll in CHEM 2200, 2210, or CHEM 2300. Similarly, students may not enroll in a course (typically of lower number) that is a prerequisite to a course they already have taken. For example, a student who has completed an organic chemistry laboratory cannot subsequently enroll in a general chemistry laboratory.

Special restrictions on laboratory courses Although the department does not recommend it, chemistry courses may be taken without the accompanying laboratory. However, the appropriate lecture course is a prerequisite or corequisite for each laboratory course. Students dropping the lecture course corequisite with a laboratory must also drop the laboratory course.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites CHEM 1610 and 1650 or CHEM 1700 (CHEM 1630 and 1670 are not offered AY 2025-2026); CHEM 1340L, 1360L, or CHEM 1710L; MATH 1150 or 1160; (MATH 1200, MATH 1210, or ENAS 1510 suggested); PHYS 1700, 1800, 2000, or 2600; or equivalents in adv placement

Number of courses *B.A.*— 10 course credits, beyond prereqs (incl senior req); *B.S.*— 13 course credits, beyond prereqs (incl senior requirement); *B.S., intensive major*— 15 course credits, beyond prereqs (incl senior req)

Specific courses required *All degrees*—5 course credits as listed under common degree requirements; *B.S.*—CHEM 3300L, 3330; *B.S., intensive major*—CHEM 3300L, 3330; second term of intro physics, PHYS 1710 or higher

Distribution of courses *B.A. and B.S.*—4 additional course credits in advanced lectures or labs, incl at least 1 lecture credit and 1 lab; *B.S., intensive major*—5 additional course credits in advanced lectures or labs, incl at least 2 credits of lectures and 1 lab

Substitution permitted Up to 2 relevant advanced science courses in other departments for adv chemistry courses with DUS permission

Senior requirement *B.A.*—CHEM 4000; *B.S.*—2 terms of CHEM 4900, or CHEM 4000 and 1 additional course credit in advanced lecture or lab; *B.S., intensive major*—2 terms of CHEM 4900; all degree programs require submission of senior capstone essay

FACULTY OF THE DEPARTMENT OF CHEMISTRY

Professors Victor Batista, Gary Brudvig, Robert Crabtree (*Emeritus*), Jason Crawford, †Craig Crews, R. James Cross, Jr. (*Emeritus*), Jonathan Ellman, John Faller (*Emeritus*), Nilay Hazari, Seth Herzon, Patrick Holland, Mark Johnson, William Jorgensen, J. Patrick Loria, James Mayer, J. Michael McBride (*Emeritus*), Scott Miller, Peter Moore (*Emeritus*), Timothy Newhouse, †Anna Pyle, †James Rothman, Martin Saunders (*Emeritus*), †Dieter Söll, David Spiegel, †Scott Strobel, John Tully (*Emeritus*), Patrick Vaccaro, Hailiang Wang, Kenneth Wiberg (*Emeritus*), Elsa Yan, Frederick Ziegler (*Emeritus*), Kurt Zilm

Associate Professor Sarah Slavoff

Assistant Professors Amymarie Bartholomew, Caitlin Davis, †Stavroula Hatzios, Stacy Malaker, †Mingjiang Zhong

Lecturers Paul Anastas, Paul Cooper, Christine DiMeglio, Laura Herder, Jonathan Parr

Preceptors TBD

†A joint appointment with primary affiliation in another department.

Child Study

Director of undergraduate studies: James McPartland (james.mcpartland@yale.edu); medicine.yale.edu/childstudy/

The Child Study Center is a department at Yale University School of Medicine which brings together multiple disciplines to further the understanding of the problems of children and families. Among the many disciplines are child psychiatry, pediatrics, genetics, neurobiology, epidemiology, psychology, nursing, social work, and social policy. The mission of the Yale Child Study Center is to improve the mental health of children and families, advance understanding of their psychological and developmental needs, and treat and prevent childhood mental illness through the integration of research, clinical practice, and professional training. The Child Study Center is unique in its scope of research, clinical services, training programs, policy work, and its local, state, national, and international collaborations. The strengths of the Center are reflected in the breadth and integrative nature of research, clinical services and training. More information is available on the Child Study Center website.

Classics

Director of undergraduate studies: Jessica Lamont (dus.classics@yale.edu); 304 Phelps Hall; classics.yale.edu

The Department of Classics offers a major in Classics, concentrating in either Greek or Latin literature, or in both literatures; a major in Classical Civilization; and, in conjunction with the Hellenic Studies program, a major in Ancient and Modern Greek. The diversity of subject matter covered by these majors makes Classics an excellent partner in interdepartmental major programs. Programs for all majors must be approved by the director of undergraduate studies (DUS).

COURSE NUMBERING

All CLCV courses are taught in translation, with no knowledge of Greek or Latin required. CLCV courses numbered 0001–0999 are First-Year Seminars, with enrollment limited to eighteen. CLCV courses numbered at the 1000-level and 2000-level are primarily introductory, lecture-style courses, which may or may not include a discussion-section component. CLCV courses numbered at the 3000-level and 4000-level are primarily intermediate and advanced discussion-oriented seminars, with enrollment limited to eighteen. The second digit of CLCV course codes indicates their subject: 1 designates Greek literature; 2 designates Latin literature; 3 designates general literature; 4 designates Greek history; 5 designates Roman history; 6 designates general history; 7 designates history of art; 8 designates archaeology; and 9 designates philosophy.

For language courses in Ancient Greek (GREK) and Latin (LATN), those at the 1000-level and 2000-level are introductory and intermediate courses (L1, L2, L3, and L4) designed to be taken in the first and second years for students with no prior knowledge. Those at the 3000-level are "bridge" courses designed to transition students from intermediate to advanced reading courses (L4 to L5). Those at the 4000-level are advanced seminar-style courses (L5). The final digit of each language course conveys what language designation it confers (e.g., GREK 2003 confers L3, LATN 4215 confers L5, etc.). The second and third digits order courses chronologically by latest author.

PLACEMENT PROCEDURES

Students are encouraged to take courses as advanced as they can handle with profit and pleasure. The department, recognizing the great variety of preparation in ancient languages, wishes to accommodate incoming students in as flexible a manner as possible. Students who plan either to begin or to continue the study of Greek or Latin should consult the DUS and Classics Language Program Director as soon as possible.

Students who have had the equivalent of two years of college-level instruction may try a 4000-level course, though the faculty may recommend a 3000-level course instead. It is possible to take GREK 2004 or LATN 2004 after a 4000-level course or to be admitted to a 4000-level course after completion of GREK 2003 or LATN 2003.

REQUIREMENTS OF THE MAJOR IN CLASSICS

See Links to the attributes indicating courses approved for the Classics major requirements.

The major in Classics is primarily a liberal arts major. It provides a rigorous interdisciplinary education in the literature, material culture, and history that underlie Western civilization and other humanities disciplines; it can also provide foundational disciplinary expertise for students who wish to do professional graduate work. Students develop a mastery of the classical languages, become acquainted with important periods and major authors in Greek and Roman literature, and develop the linguistic, historical, and theoretical interpretative tools to analyze classical antiquity and its relevance in the modern world. All courses in the department emphasize a combination of precise analysis, original thought, creativity, and breadth of historical inquiry. Courses in other literatures, in history, in history of art, and in philosophy are strongly recommended for students enrolled in the Classics major.

The department recognizes three concentrations for this major: one aiming at knowledge of both ancient literatures, Greek and Latin; a second concentrating on Greek literature; and a third concentrating on Latin literature.

The concentration in two literatures requires no fewer than twelve term courses (including the senior requirement). These include six language courses in both Greek and Latin at the level of 3000 or above, of which no fewer than two must be taken in each language. These six courses must include GREK 4995 or LATN 4995. Also required are one course that covers broadly the literature and/or culture of ancient Greece (CLCV at the 1000- or 2000-level), one course that covers broadly the literature and/or culture of ancient Rome (CLCV at the 1000- or 2000-level), one course in a related field in ancient history, and one course in a related field in ancient history, ancient philosophy, classical art and archaeology, or classical civilization.

Students concentrating in one literature (Greek or Latin) are required to take no fewer than twelve term courses (including the senior requirement). These include six language courses in that literature at the level of 3000 or above and must include GREK 4995 or LATN 4995. Also required are one course that covers broadly the literature and/or culture of ancient Greece (CLCV at the 1000- or 2000-level), one course that covers broadly the literature and/or culture of ancient Rome (CLCV at the 1000- or 2000-level), a course in ancient history related to the chosen literature, and an additional course in ancient history, classical art and archaeology, ancient philosophy, or classical civilization. Students are encouraged to do some work in the second language and may substitute two terms at the intermediate level (2003 and 2004) or higher in the second language for two 3000-level or 4000-level courses in the major literature.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students must enroll in one or two semesters of the Classics Senior Tutorial (either CLSS 4998 *or* CLSS 4999, or *both* CLSS 4998 *and* CLSS 4999). The Senior Tutorial is designed to accommodate a range of culminating experiences in the field of Classics: an original work of scholarly research, an intensive study of language and literature based

on a customized reading list, or an alternative creative project. A faculty advisor should be selected and a brief proposal submitted for approval by the end of the junior year. Students who elect the one-term Senior Tutorial must take one additional course to fulfill the requirements of the major; this can be any course designated CLCV, CLSS, LATN, or GREK; or—with approval of the DUS—a relevant course in another field of study.

Combined B.A./M.A. degree Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in Classics.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior requirement)

Specific courses required GREK 4995 or LATN 4995

Distribution of courses *All concentrations*—1 course that covers broadly the literature and/or culture of ancient Greece, and 1 course that covers broadly the literature and/or culture of ancient Rome; 1 addtl course in ancient hist, classical art and archaeology, ancient philosophy, or classical civ; *Two literatures concentration*—6 courses in both langs at level 3000 or above, with one of those being GREK 4995 or LATN 4995; 1 course in ancient hist; *One literature concentration*—6 courses in lit at level 3000 or above, with one of those being GREK 4995 for the Greek major and LATN 4995 for the Latin major; 1 course in ancient hist related to lit of major

Substitution permitted *One literature*—2 courses in the other literature numbered 2003 and 2004 or higher for 2 courses in the major literature at the 3000-level or 4000-level

Senior requirement Two terms of Senior Tutorial (CLSS 4998 and CLSS 4999) or one-term of Senior Tutorial (CLSS 4998 or CLSS 4999) and an additional course

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REQUIREMENTS OF THE MAJOR IN CLASSICAL CIVILIZATION

See Links to the attributes indicating courses approved for Classical Civilization major requirements.

The major in Classical Civilization is designed to offer students an opportunity to study an entire Western civilization in its many diverse but related aspects. The literature, history, philosophy, religion, art, archaeology, and other aspects of Greek and Roman antiquity from the earliest beginnings in Greece to the Middle Ages are studied for their intrinsic artistic value, their historical significance, and their power to illuminate problems confronting contemporary societies. Each year, the department offers courses that focus on ways that subsequent ages have used and made sense of classical antiquity. Ancient texts are studied primarily in translation under the guidance of instructors who have expertise in Greek and Latin.

Candidates for the major complete at least twelve term courses (including the Senior Tutorial) in Classics and related departments. Of these, two must be in ancient history and/or classical art and archaeology, and two must be in Greek or Latin, or both, numbered 2003 or higher (the latter courses should be completed by the end of the junior year). Students must also take one course that covers broadly the literature and/or culture of ancient Greece (CLCV at the 1000- or 2000-level) and one term course that covers broadly the literature and/or culture of ancient Rome (CLCV at the 1000- or 2000-level). It is strongly recommended that candidates elect one course each in the general areas of ancient epic, drama, philosophy, Roman civilization, and the classical tradition. Candidates for the major are encouraged to take related courses in other departments.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

SENIOR REQUIREMENT

Students must enroll in one or two semesters of the Classical Civilization Senior Tutorial (either CLCV 4998 *or* CLCV 4999, or *both* CLCV 4998 *and* CLCV 4999). The Senior Tutorial is designed to accommodate a range of culminating experiences in the field of Classics: an original work of scholarly research, an intensive study of language and literature based on a customized reading list, or an alternative creative project. A faculty advisor should be selected and a brief proposal submitted for approval by the end of the junior year. Students who elect the one-term Senior Tutorial must take one additional course to fulfill the requirements of the major; this can be any course designated CLCV, CLSS, LATN, or GREK; or—with approval of the DUS—a relevant course in another field of study.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior requirement)

Specific courses required None

Distribution of courses 2 courses in ancient history and/or classical art and archaeology; 2 courses in Greek or Latin, or both, numbered 2003 or higher; 1 course that covers broadly the literature and/or culture of ancient Greece; and 1 course that covers broadly the literature and/or culture of ancient Rome

Senior requirement Two terms of Senior Tutorial (CLCV 4998 and CLCV 4999) or one-term of Senior Tutorial (CLCV 4998 or CLCV 4999) and additional course

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REQUIREMENTS OF THE MAJOR IN ANCIENT AND MODERN GREEK

See Links to the attributes indicating courses approved for Ancient and Modern Greek major requirements.

The major in Ancient and Modern Greek offers students an opportunity to integrate the study of postclassical Greek language, history, and culture with the departmental program in ancient Greek and classical civilization. The major covers Hellenic civilization from the Bronze Age to the modern day and traces the development of the language and the culture across traditionally drawn boundaries. The study of both

ancient and modern Greek allows the student to appreciate how familiarity with one enriches understanding of the other and to chart the development of a language which has one of the oldest continuous written traditions in the world. The literature, history, philosophy, religion, and art of the ancient Greek and Greco-Roman worlds are studied both as ends in themselves and also as a foundation for appreciating later (medieval, Ottoman, and modern) developments in these areas. Students are encouraged to develop a sense of the continuity of Greek language and culture and an understanding of how Byzantine and modern forms relate to their ancient forebears.

The major in Ancient and Modern Greek requires at least twelve term courses. These include four term courses at the level of 3000 or above in ancient Greek, one of which should be GREK 4995, and four term courses consisting of: one term course that covers broadly the literature and/or culture of ancient Greece (a course with the designation CLCV at the 1000- or 2000-level), one term course that covers broadly the literature and/or culture of ancient Rome (a course with the designation CLCV at the 1000- or 2000-level), one term course in ancient Greek history, and at least one additional term course in the history, history of art, literature, or culture of the Greek-speaking Balkans or the Hellenic diaspora in the medieval, Ottoman, or modern period. Candidates are encouraged to take a wide range of courses in the areas of ancient philosophy, religion, art, and architecture. In addition, no fewer than two term courses in modern Greek (HELN) must be elected at the intermediate level (HELN 1300, HELN 1400) or above.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

SENIOR REQUIREMENT

Students must enroll in one or two semesters of the Classics Senior Tutorial (either CLSS 4998 *or* CLSS 4999, or *both* CLSS 4998 *and* CLSS 4999). The Senior Tutorial is designed to accommodate a range of culminating experiences in the field of Classics: an original work of scholarly research, an intensive study of language and literature based on a customized reading list, or an alternative creative project. A faculty advisor should be selected and a brief proposal submitted for approval by the end of the junior year. Students who elect the one-term Senior Tutorial must take one additional course to fulfill the requirements of the major; this can be any course designated CLCV, CLSS, LATN, or GREK; or—with approval of the DUS—a relevant course in another field of study.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior requirement)

Specific courses required GREK 4995

Distribution of courses 4 term courses in ancient Greek numbered 3000 or higher, as indicated, and incl GREK 4995; 4 term courses in Greek and Roman history and lit, as indicated; 2 term courses in modern Greek at the intermediate level

Senior requirement Two terms of Senior Tutorial (CLSS 4998 and CLSS 4999) or one-term of Senior Tutorial (CLSS 4998 or CLSS 4999) and an additional course

CERTIFICATES OF ADVANCED LANGUAGE STUDY

The Classics Department offers a Certificate of Advanced Language Study to non-majors in ancient Greek and in Latin. A certificate adviser, typically the director of undergraduate studies (DUS), advises students on the certification process. The Certificate of Advanced Language Study, once certified, is listed on the student transcript.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses in ancient Greek or Latin beyond the L4 level (i.e., four L5 courses; 3000- or 4000-level Greek or 3000- or 4000-level Latin courses). All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the certificate adviser, one course, such as an independent study course (graded pass/fail), a graduate seminar, or an advanced seminar, may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course taught in English to count toward the certification requirements, provided the course includes, at minimum, a weekly discussion section conducted entirely in the target language. The discussion section must enroll a minimum of three students and the course must be designated as LxC in the course description.

The adviser may also approve the substitution of up to two credits earned during study abroad and taught in the target language to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure those courses appear on their transcripts.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY OF THE DEPARTMENT OF CLASSICS

Professors Egbert Bakker, Kirk Freudenburg, Milette Gaifman, Verity Harte, Brad Inwood, Christina Kraus, Noel Lenski, Pauline LeVen, Joseph Manning, James Uden

Associate Professor Andrew Johnston

Assistant Professors Malina Buturović, Alexander Ekserdjian, Benedek Kruchió, Jessica Lamont, Erika Valdivieso

Lectors John Dillon, James Patterson, Timothy Robinson

Climate Science and Solutions Certificate

Certificate director: Jeffrey Park (jeffrey.park@yale.edu)

This Certificate provides students with a foundation in basic climate science, anthropogenic climate change, and solutions, so they can be effective and informed leaders in all walks of life in the decades to come. In our lifetimes, the combined effects of climatic and environmental change will profoundly and pervasively alter the planet and the lives of all of us. In this day and age, effective leaders cannot afford to be ignorant of climate change and the many possible ways to mitigate it and its effects. Climate change is one of humanity's grand challenges and the goal of this Certificate is to prepare students to meet this challenge wherever their paths might lead.

REQUIREMENTS

See Links to the attributes indicating courses approved for the certificate requirements.

Students must successfully complete six course credits. Three of the required courses must represent three different pillars of thought, each designed to provide the fundamentals, vocabulary, and interdisciplinary scope to engage in integrative conversations, collaborations, and endeavors on climate change and solutions. The three pillars of thought are basic climate science; the science and impacts of anthropogenic climate change; and climate solutions.

From the first pillar, students gain an understanding of the components, processes, and feedback of the climate system, including an overview of ocean-atmosphere dynamics, the carbon cycle, atmospheric gases, and their effects, radiative balance, and spatial and temporal climate variability. (YC Climate Basic Climate Sci)

From the second pillar, students learn about drivers and projections for anthropogenic climate change, the feedback and uncertainties in regional-to-global climate models, regional-to-global climate change impacts, mitigation, and adaptation, and the interaction between climate and other aspects of global societal and environmental change. (YC Climate Anthropogenic)

From the third pillar, students learn about climate solutions, including the scientific, technological, and socio-political aspects of natural and technological solutions and strategies. (YC Climate Solutions)

One of the remaining 3 courses needs to be designated as a seminar on climate science and solutions as approved by the certificate director. Three of the 6 courses must have a science, engineering, or technology focus.

No more than two course credits fulfilling the requirements of the Climate Science and Solutions certificate may overlap with a major, a simultaneous degree, or another certificate. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major. No more than four credits may come from a single department or school.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the certificate.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the certificate requirements with the approval of the certificate director. An on-topic summer internship can replace one elective.

DECLARATION OF CANDIDACY

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

REQUIREMENTS OF THE CERTIFICATE

Number of courses 6 course credits

Distribution of courses 1 course in each of three pillars; 3 of the 6 required courses must focus on science, engineering, or technology, and 1 should be a seminar on the climate science and solutions of climate crisis

Cognitive Science

Director of undergraduate studies: Tyler Brooke-Wilson (tyler.brooke.wilson@yale.edu), 102 C, 432-1699; www.yale.edu/cogsci

Cognitive science explores the nature of cognitive processes such as perception, reasoning, memory, attention, language, decision making, imagery, motor control, and problem solving. The goal of cognitive science, stated simply, is to understand how the mind works. Cognitive science is an inherently interdisciplinary endeavor, drawing on tools and ideas from fields such as psychology, computer science, linguistics, philosophy, economics, and neuroscience. Approaches include empirical studies of the ontogenetic and phylogenetic development of cognitive abilities, experimental work on cognitive processing in adults, attempts to understand perception and cognition based on patterns of breakdown in pathology, computational and robotic research that strives to simulate aspects of cognition and behavior, neuroscientific investigations of the neural bases of cognition using neural recording and brain scanning, and the development of philosophical theories of the nature of mind.

PREREQUISITE

An introductory survey course, CGSC 1100, is normally taken by the end of the fall term of the sophomore year and prior to admission to the major.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2025–2026, may be fulfilled by students who declared the major in a prior term.

See Links to the attributes indicating courses approved for Cognitive Science major requirements.

The requirements of the major for the B.S. and B.A. degrees are the same, except for the senior requirement. Fifteen term courses, for a total of thirteen and one half course credits, are required for the major, including the introductory course and the senior requirement. Each major program must include the elements described below. The particular selection of courses must be approved by the director of undergraduate studies (DUS) in order to assure overall coherence. No course may be used to fulfill more than one requirement for the major.

Breadth requirement A breadth requirement introduces students to the subfields of cognitive science. Each major is required to take a course from four of the following six areas:

1. Computer science: CPSC 2010
2. Economics and decision making: ECON 2159
3. Linguistics: LING 1100, LING 1160, 1300, 1179, 2320, 2530
4. Neuroscience: MCDB 3200, NSCI 3400, PSYC 1600, 2670
5. Philosophy: PHIL 1126, 1182, 2269, 2270, 2271
6. Psychology: PSYC 1100, S139E, 1400

Depth requirement Students fulfill a depth requirement by completing six courses that focus on a specific topic or area in cognitive science. The depth courses must be chosen from at least two disciplines, and are typically drawn from the six cognitive science subfields. It may be possible to draw depth courses from other fields when necessary to explore the student's focal topic, in consultation with the DUS. All six depth courses must be intermediate or advanced; for most disciplines, courses numbered 3000 or above fulfill the requirement. With permission of the DUS, up to two directed reading or research courses may count toward the depth requirement.

Skills requirement Because formal techniques are fundamental to cognitive science, one skills course is required, preferably before the senior year. Courses that fulfill the skills requirement include CPSC 1001, 2020, LING 2249, PSYC 2670, S&DS 1000, 2200, 2300, and S107E. Other courses may fulfill this requirement with the permission of the DUS.

Junior colloquium In the junior year, students are required to take CGSC 3950, a half-credit colloquium in which majors discuss current issues and research in cognitive science and select a senior essay topic.

Repeat for credit Only one term of CGSC 4710, 4720, 4730, or 4740 may be offered toward the major.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, except with permission of the DUS.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

In the senior year, students take a full-credit capstone course in which the senior essay is written. Students in the course meet regularly with one another and with the faculty member to discuss current work in cognitive science and their own developing research projects. Students must take this course during their senior year.

B.S. degree program The B.S. degree requires two half-credit courses for one-course credit of empirical research, CGSC 4900 and 4910. These courses are only open to Cognitive Science seniors and receive a letter grade. This normally includes designing an experiment and collecting and analyzing data.

B.A. degree program The B.A. degree requires two half-credit courses for one-course credit of nonempirical research, CGSC 4800 and 4810. These courses are only open to Cognitive Science seniors and receive a letter grade. There are no restrictions on the research format.

ADVISING AND APPLICATION TO THE MAJOR

Students may apply to enter the major at any point after the first year. Applications must be submitted online through Qualtrics. Applications must include (1) an official or unofficial transcript of work at Yale, (2) a brief statement of purpose, which indicates academic interests and expected focus within the areas of the Cognitive Science major, and (3) a list of the six upper-level courses that the student plans to take as part of

the research focus. The application link and answers to frequently asked questions are available on the program website.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite CGSC 1100

Number of courses 15 term courses, for a total of 13.5 course credits (incl prereq and senior req)

Specific course required CGSC 3950

Distribution of courses 1 course each in 4 of 6 subfields, as specified for breadth req; 6 courses in a specific topic or area, as specified for depth req; 1 skills course, as specified

Senior requirement *B.S.*—CGSC 4900 and CGSC 4910; *B.A.*—CGSC 4800 and CGSC 4810

FACULTY ASSOCIATED WITH THE PROGRAM IN COGNITIVE SCIENCE

Professors Woo-kyoung Ahn (*Psychology*), Stephen Anderson (*Emeritus*), Amy Arnsten (*School of Medicine*), Richard Aslin (*Haskins Laboratories)*, John Bargh (*Psychology*), Paul Bloom (*Emeritus*) (*Psychology*), Hal Blumenfeld (*School of Medicine*), Claire Bowern (*Linguistics*), Nicolò Cesana-Arlotti (*Psychology*), Marvin Chun (*Psychology*), Veneeta Dayal (*Linguistics*), Michael Della Rocca (*Philosophy*), Ravi Dhar (*School of Management*), Julie Dorsey (*Computer Science*), Melissa Ferguson (*Psychology*), Robert Frank (*Linguistics*), Shane Frederick (*School of Management*), David Gelernter (*Computer Science*), Tamar Gendler (*Philosophy*), Laurence Horn (*Emeritus*) (*Linguistics*), Marcia Johnson (*Emeritus*), Christine Jolls (*Law School*), Dan Kahan (*Law School*), Frank Keil (*Psychology, Linguistics*), Joshua Knobe (*Philosophy*), Gregory McCarthy (*Psychology*), Nathan Novemsky (*School of Management, Psychology*), Kenneth Pugh (*School of Medicine*), Ian Quinn (*Music*), Holly Rushmeier (*Computer Science*), Laurie Santos (*Psychology*), Brian Scassellati (*Computer Science, Mechanical Engineering*), Brian Scholl (*Chair*) (*Psychology*), Sun-Joo Shin (*Philosophy*), Jason Stanley (*Philosophy*), Zoltán Szabó (*Philosophy*), Nick Turk-Browne (*Psychology*), Tom Tyler (*Law School*), Julie Van Dyke (*Haskins Laboratories*), Fred Volkmar (*School of Medicine*), David Watts (*Anthropology*), Karen Wynn (*Emeritus*) (*Psychology*), Gideon Yaffe (*Law School*), Raffaella Zanuttini (*Linguistics*), Gal Zauberman (*School of Management*), Steven Zucker (*Computer Science, Biomedical Engineering*)

Associate Professors Philip Corlett (*School of Medicine*), Jason Dana (*School of Management*), Yarrow Dunham (*Psychology*), Hedy Kober (*School of Medicine*), James McPartland (*Child Study Center*), Maria Piñango (*Linguistics*)

Assistant Professors Ryan Bennett (*Linguistics*), Steve Chang (*Psychology*), Philip Corlett (*School of Medicine*), Julian Jara-Ettinger (*Psychology*), Julia Leonard (*Psychology*), Samuel McDougle *(Psychology)*, Al Powers (*School of Medicine*), Robb Rutledge (*Psychology*), Marynel Vázquez (*Computer Science*), Ilker Yildirim (*Psychology*)

Lecturer Daylian Cain (*School of Management*)

Collections: Objects, Research, Society

Certificate directors: Lucy Mulroney (lucy.mulroney@yale.edu); Ayesha Ramachandran (ayesha.ramachandran@yale.edu)

This certificate exposes students to multiple forms of expertise within Yale's special collections libraries, equips them with new analytical skills, and teaches them the methodologies that scholars, librarians, archivists, conservators, and curators employ as they preserve, interrogate, and steward the human record.

Collections: Objects, Research, Society signals an expansive interest in a wide variety of materials and media—including manuscripts, written documents, and paper-based records, as well as film, audio, and other digital formats. The certificate encourages students to consider both digital and physical objects in dialogue with each other, bridging the fields of museum studies, library/archival theory and practice, book history, and cultural studies to prompt students to think critically about both objects and the repositories in which they are held. Students engage with Yale Library's special collections repositories, including: Beinecke Rare Book & Manuscript Library, Yale Film Archive, Whitney Medical Historical Library, Divinity Library, Gilmore Music Library, Haas Family Arts Library, the Lewis Walpole Library. Additionally, students will have opportunities to work with the Yale Peabody Museum, Yale Center for British Art, Yale University Art Gallery, the Yale Law Library, and the Institute for the Preservation of Cultural Heritage.

REQUIREMENTS

See Links to the attributes indicating courses approved for the Collections certificate requirements.

Students must complete five courses (5 credits), including an introductory seminar (pending), and a one-credit capstone (pending). The remaining three courses expose students to the three areas of study listed below. Students must take two courses in one of the three areas of study and a third course in one of the other two areas of study.

1. Research with Collections (*YC Collections Research*) Students gain proficiency in using collections to perform original research.

2. Collections in Society (*YC Collections Society*) Students learn the social, communal, and institutional aspects of collections.

3. Creative Critical Engagement with Collections (*YC Collections Engagement*) Students learn to engage creatively with collections and think broadly about how repositories and objects are organized.

The mandatory capstone culminates in a project focused on material histories. This may take the form of an internship in the collections, a research project, working on an exhibit, a collections-intensive course that yields a robust final project, or other hands-on experience.

No more than two course credits fulfilling the requirements of the certificate may overlap with a major, a simultaneous degree, or another certificate. Additionally, no course credit may be applied toward the requirements of more than two curricular

programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major. Approved graduate and professional school courses may count toward the certificate. The minimum grade for all courses is a C.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the certificate.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the certificate requirements with the approval of the certificate director. An on-topic summer internship can replace one elective.

DECLARATION OF CANDIDACY

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

Students must also complete an enrollment form available on the Collections (Materials Histories of the Human Record) website.

SUMMARY OF REQUIREMENTS

Number of courses 5 course credits

Distribution of courses introductory course (pending), MHHR 4900 (capstone), and 3 electives

College Seminars Program

The Residential College Seminar Program is designed to enhance the intellectual life of the residential colleges by offering courses that fall outside typical departmental structures, often taught by instructors whose professional life lies outside the university. Each residential college sponsors one seminar each term, and a defining feature of the program is that undergraduates play a central role in the seminar selection process. Each residential college has a student committee responsible for evaluating seminar proposals and interviewing candidates.

Course descriptions for college seminars for the fall and spring terms can be found in Yale Course Search. Students may search for college seminars by selecting YC College Seminar under the "Any Department" dropdown in the left side search panel. The online listings contain course titles, descriptions, and prerequisites. Course syllabuses are available on Canvas @ Yale.

Students apply to college seminars during registration. Students from the sponsoring college have priority admission to the first six roster spots in each seminar. Students may apply to no more than two college seminars in a given term and may only enroll in one college seminar per term, with a maximum of four college seminars in their Yale College career. Auditing is not permitted in college seminars. See the YCPS, K. Special Academic Programs, Limit on Residential College Seminars, for more information.

Comparative Literature

Director of undergraduate studies: Samuel Hodgkin (samuel.hodgkin@yale.edu); complit.yale.edu/literature-major

The Comparative Literature major allows students to address fundamental questions about the nature, function, and value of literature in a broadly comparative context. Students read and write about a wide variety of literary works across periods, genres, and national traditions. They investigate ancient and contemporary approaches to literary study, theories and methods of comparison, and the relationship of literature to film and other media. Majors have the freedom to construct a program of study that reflects their intellectual goals. All prospective majors should register with the director of undergraduate studies (DUS), who will work with them to develop a coherent sequence of courses suited to their individual interests.

The Comparative Literature major offers four unique concentrations: Literature and Comparative Cultures; Intensive Language; Film; and Literary Translation. These concentrations share the same core courses. Other courses are normally chosen from different language and literature programs, many of which offer courses on literature and film in translation. Among these programs are African American Studies, Classics, East Asian Languages and Literatures, English Language and Literature, Film and Media Studies, French, German Studies, Italian Studies, Near Eastern Languages and Civilizations, Portuguese, Slavic Languages and Literatures, and Spanish.

Prospective majors are strongly encouraged to begin the study of a language other than English as early as possible in their academic careers and to continue such study throughout their time at Yale. All concentrations of the Comparative Literature major require students to have advanced (L5) competence in at least one language other than English. Students interested in graduate study in comparative literature should be aware that many programs require reading knowledge of two or three languages other than English.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for Comparative Literature major requirements.

The Comparative Literature major requires twelve term courses, including the senior requirement and two required foundational seminars, one of which must be CPLT 1300 and the other may be CPLT 1400 or 1430 or 3048, depending on which concentration the student is pursuing. Beyond the two required courses and the senior essay, the major requires nine term courses, with specific requirements for each concentration. Students must choose one concentration and each concentration requires students to take two or three literature and/or film courses in a single language other than English; all have a period requirement and a theory requirement. Additionally, prospective majors must achieve an L5 in the language in which they plan to fulfill their literature requirement.

For the in-language literature requirement, students must take two or three courses (depending on the concentration) reading literature in a single language other than English. One L4 course can be counted, but the remaining courses must be taken at L5 or equivalent. Students may count non-instructional language courses (no L4 or L5

distributional designation number) in which reading knowledge of the language is a prerequisite and extensive in-language readings are assigned. With DUS permission, one of the in-language literature requirements may be fulfilled with a language course, not specifically marked as a literature or film course, that includes substantial literary readings and/or film screenings.

For the period requirement, students must take at least one course in three of five historical periods: (1) Antiquity (covering until approximately the 6th century AD); (2) Medieval (ca. 6th-15th centuries); (3) Early Modern (ca. 14th-18th centuries); (4) 19th century; and (5) 20th-21st centuries. In practice, many courses deal with texts covering several periods. A course may fulfill the requirement for any period if at least half the primary readings come from that period. For questions about which period requirements a course might fulfill consult the DUS.

For the theory requirement, students must take one course that involves a significant component of literary or cultural theory. Students who wish to know if a course, particularly those offered in other departments, may count toward this requirement should consult the DUS.

LITERATURE AND COMPARATIVE CULTURES CONCENTRATION

Literature and Comparative Cultures is the least constraining concentration, permitting students to plan a course of study tailored to their particular interests. Prospective majors electing the Literature and Comparative Cultures concentration must take two required foundational seminars; CPLT 1300 and one of CPLT 1400, 1430, or 3048. Beyond the two required courses and the senior essay, the concentration requires three in-language literature courses with readings in a language other than English (see under Requirements of the Major for more information), three courses that fulfill the period requirement, two elective courses, and one theory course. Period courses, elective courses, and the theory course may be taken in any literature department (including English) and may include two courses in a related discipline that has a direct bearing on the student's program of study in literature, such as history of art, philosophy, anthropology, music, or theater studies. One of the electives may be in creative writing or Directed Studies, but composition courses (ENGL 1014, 1015, or 1020) may not be counted.

INTENSIVE LANGUAGE CONCENTRATION

Prospective majors electing this concentration focus their plan of study on literature studied in two languages other than English. They must take two required foundational seminars: CPLT 1300 and CPLT 1400; three courses that fulfill the period requirement; three in-language literature courses in a single language other than English (see under Requirements of the Major for more information); two literature courses in a second language other than English; and one course that involves a significant element of literary or cultural theory.

FILM CONCENTRATION

Students in the Film concentration focus their plan of study on film and media. They must take two required foundational seminars: CPLT 1300 and CPLT 1430; three courses that fulfill the period requirement; two (rather than three) in-language literature courses with readings in the same language other than English (see under Requirements of the Major for more information); three electives (which must have a

FILM course number); and one course in film theory. At least one of the in-language literature courses must be at the L5 level.

LITERARY TRANSLATION CONCENTRATION

Students in the Literary Translation concentration focus on the theory and practice of literary translation. They must take two required foundational seminars: CPLT 1300 and CPLT 3048; three courses that fulfill the period requirement; three in-language literature courses in a single language other than English, two of which must be an L5 course (see under Requirements of the Major for more information); one course in literary or cultural theory; and two courses that engage with some aspect of translation studies. The DUS can provide a list of qualifying courses.

Credit/D/Fail No more than two courses taken Credit/D/Fail may be applied toward the requirements of the major, with permission of the DUS. None of the specific required courses may be taken Credit/D/Fail.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

For the senior essay (CPLT 4910, or CPLT 4920, 4930), students develop a research topic of their choice and work closely with a faculty adviser, preferably from the department. Normally, the essay makes use of texts in the language of their original composition. Any exceptions must be approved by the DUS. Deadlines for the prospectus, the rough draft, and the completed essay are listed on the departmental website. The initial deadline for a topic proposal signed by the thesis adviser is before the end of the previous semester, so majors should begin their search for an adviser and topic early in the spring of their junior year.

The senior essay may be written over one term (CPLT 4910) or over two terms (CPLT 4920, 4930). Students with an especially well-developed project may petition to write a yearlong senior essay. Interested juniors must apply by the last day of classes in the spring term. Students may count the second term of the essay as one elective course toward the total number of courses required for the major. Students expecting to graduate in May enroll in CPLT 4920 during the fall term and complete their essays in CPLT 4930 in the spring term. December graduates enroll in CPLT 4920 in the spring term and complete their essays in CPLT 4930 during the following fall term.

COURSE SUBSTITUTIONS

A literature course taught in English translation is sometimes suitable as a non-English literature course. In such cases, majors are expected to request additional assignments from their instructors that demonstrate they have engaged with the texts in the original language. They should submit the appropriate form, signed by the instructor, attesting to their intent to do so. The department registrar or the DUS can provide this form; students should submit it to the DUS at the beginning of the semester along with their course schedule.

Non-native speakers of English who are granted permission by Yale College to complete the language distributional requirement by taking ENGL 1014, 1015, 1020, or 3450 may take a total of three English literature courses to fulfill the three in-language literature

course requirements, or they may fulfill the major requirements by taking three courses in a third language.

STUDY ABROAD

Comparative Literature majors are encouraged to consider spending a summer, a term, or a year abroad. One course taken through international programs and approved by Yale College may, with permission of the DUS, be applied to the in-language literature requirement.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior requirement and concentration requirements)

Specific courses required *All concentrations*—CPLT 1300; *Literature and Comparative Cultures*—1 of CPLT 1400, 1430, or 3048; *Intensive Language*—CPLT 1400; *Film*—CPLT 1430 or equivalent; *Literary Translation*—CPLT 3048 or equivalent

Distribution of courses *All concentrations*—3 period courses, as specified; *Literature and Comparative Cultures*—3 in-language literature courses, as specified, 1 course in literary or cultural theory, 2 elective courses; *Intensive Language*— 3 literature courses in one language, 2 literature courses in a second language, 1 course in literary or cultural theory; *Film*—2 in-language lit courses, 1 course in film theory; 3 electives in Film and Media Studies; *Literary Translation*—3 in-language literature courses, as specified, 1 course in literary or cultural theory, 2 courses in translation studies

Senior requirement One-term senior essay (CPLT 4910); or two-term senior essay (CPLT 4920 and CPLT 4930)

FACULTY OF THE DEPARTMENT OF COMPARATIVE LITERATURE

Professors Dudley Andrew *(Emeritus),* Peter Brooks *(Emeritus),* Rüdiger Campe, Roberto González Echevarría (*Emeritus*), Martin Hägglund, Hannan Hever, Carol Jacobs (*Emeritus*), Pericles Lewis, David Quint (*Emeritus*), Ayesha Ramachandran, Shawkat Toorawa, Katie Trumpener, Jing Tsu, Jane Tylus, Jesús Velasco

Associate Professors Robyn Creswell, Marta Figlerowicz, Moira Fradinger

Assistant Professor Samuel Hodgkin

Senior Lecturers Peter Cole, Jan Hagens

Lecturers Jane Mikkelson, Candace Skorupa, George Syrimis

Affiliated Faculty R. Howard Bloch (*French*), Francesco Casetti (*Film & Media Studies*), Michael Denning (*American Studies*), Alice Kaplan (*French*), Tina Lu (*East Asian Languages & Literatures*), John MacKay (*Slavic Languages & Literatures*), Maurice Samuels (*French*), Ruth Yeazell (*English*)

Computer Science

Director of undergraduate studies: Theodore Kim (theodore.kim@yale.edu); cpsc.yale.edu

The Department of Computer Science offers both B.S. and B.A. degree programs and four combined major programs in cooperation with other departments: Electrical Engineering and Computer Science, Computer Science and Economics, Computer Science and Mathematics, and Computer Science and Psychology. Each program not only provides a solid technical education in the core of computer science but also allows students to take a broad range of courses in other disciplines that are an essential part of a liberal arts education.

Specifically, the Computer Science and combined major programs share a common core of five computer science courses. The first is CPSC 2010, a survey that demonstrates the breadth and depth of the field to students who have taken the equivalent of an introductory programming course. The remaining core courses cover discrete mathematics (CPSC 2020 or MATH 2440), data structures (CPSC 2230), systems programming and computer architecture (CPSC 3230), and algorithm analysis and design (CPSC 3650 or 3660). Only one of CPSC 3650 or 3660 may be taken for major credit. Together these courses include the material that every major should know.

The core courses are supplemented by electives (and, for a combined major, core courses in the other discipline) that offer great flexibility in tailoring a program to each student's interests. The capstone is the senior project (CPSC 4900), through which students experience the challenges and rewards of original research under the guidance of a faculty adviser.

Prospective majors are encouraged to discuss their programs with the director of undergraduate studies (DUS) as early as possible.

Introductory Courses

The department offers a broad range of introductory courses to meet the needs of students with varying backgrounds and interests. Except for CPSC 2000 and CPSC 2010, none assumes previous knowledge of computers.

1. CPSC 1001 teaches students majoring in any subject area how to program a computer and solve problems. No prior programming experience is required. Students with previous programming experience should consider taking CPSC 2010 instead. This course satisfies the Quantitative Reasoning distributional requirement.
2. CPSC 1100 teaches programming for humanities and social sciences using the Python programming language. No prior programming experience is required. This course satisfies the Quantitative Reasoning distributional requirement.
3. CPSC 1340 provides an introduction to computer music, including musical representations for computing, automated music analysis and composition, interactive systems, and virtual instrument design.
4. CPSC 1500 explores how some of the key ideas in computer science have affected philosophy of mind, cognitivism, connectionism, and related areas. This

humanities-style course requires a significant amount of reading and writing a paper, and satisfies the Writing and the Humanities and Arts distributional requirements.

5. CPSC 1510 studies the history of the graphical user interface in an attempt to guess its future. This course satisfies the Writing distributional requirement.
6. CPSC 1750 studies the C programming language and the Linux operating system. This course satisfies the Quantitative Reasoning requirement.
7. CPSC 1830 explores the myriad ways that law and technology intersect, with a special focus on the role of cyberspace. This course satisfies the Social Sciences distributional requirement.
8. CPSC 1840 focuses on the evolving and oftentimes vexing intellectual property regime of the new digital age. This course satisfies the Social Sciences and the Humanities and Arts distributional requirements.
9. CPSC 1850 covers the evolution of various legal doctrines with and around technological development. This course satisfies the Social Sciences and the Writing distributional requirements.
10. CPSC 2000, intended as a survey course for non-majors, focuses on practical applications of computing technology while examining topics including computer hardware, computer software, and related issues such as security and software engineering. This course satisfies the Quantitative Reasoning distributional requirement.
11. CPSC 2010 teaches the basic concepts, techniques, and applications of computer science, including systems (computers and their languages) and theory (complexity and computability). Students with sufficient programming experience may elect CPSC 2010 without taking CPSC 1001. (These courses meet at the same time so that students are easily able to change levels if necessary.) This course satisfies the Quantitative Reasoning distributional requirement.
12. CPSC 2020 presents the formal methods of reasoning and the concepts of discrete mathematics and linear algebra used in computer science and related disciplines. This course satisfies the Quantitative Reasoning distributional requirement.

REQUIREMENTS OF THE MAJOR

See Link to the *YC CPSC Elective attribute* indicating courses approved for major requirements.

The B.S. and the B.A. degree programs have the same required five core courses: CPSC 2010; CPSC 2020 or MATH 2440; CPSC 2230; CPSC 3230; and CPSC 3650 or 3660.

B.S. degree program The B.S. degree program requires a total of twelve term courses: five core courses, six intermediate or advanced courses in Computer Science, and the senior requirement.

B.A. degree program The B.A. degree program requires a total of ten term courses: the five core courses, four intermediate or advanced courses in Computer Science, and the senior requirement.

Combined B.S./M.S. degree Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. General eligibility requirements are described in the Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Specific requirements for the combined degree in Computer Science are as follows:

1. Candidates must satisfy the Yale College requirements for the B.S. degree in Computer Science.
2. At the end of their fifth term of enrollment, candidates must have earned at least nine of their Computer Science required course credits, which together with three additional Computer Science required course credits, satisfy the requirements for the B.S. in Computer Science. Candidates must also have achieved A grades (only A, not A-) in at least three-quarters of these courses.
3. Candidates must also complete eight graduate courses from the approved list, up to two of which may, with the permission of the DUS and the director of graduate studies, also be applied toward completion of the B.S. degree. At most one of these eight courses may be CPSC 6920. All eight graduate courses must be completed in the final four terms of enrollment, and at least six of them must be completed in the final three terms of enrollment.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major. All courses in the major must be taken for a letter grade.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

In the senior year, students must take CPSC 4900, an independent project course, in which a student selects an adviser to conduct original research with substantial work in a subfield of computer science. With permission of the DUS, students may enroll in 4900 more than once or before their senior year.

ADVISING

All Computer Science majors in the sophomore, junior, and senior years should review their programs with their class advisers and the DUS. Students majoring in Computer Science are advised to complete CPSC 2010 and 2230 by the end of their sophomore year.

Electives The field of computer science has broadened substantially in the last few decades and the Computer Science department advises its majors to choose intermediate and advanced electives covering the breadth of computer science, including theoretical computer science; computer systems and languages (e.g., database, networking, operating systems, programming languages, and systems security); and computer applications (e.g., artificial intelligence, computer graphics, computer vision, human-computer interactions, machine learning, natural language processing, and robotics).

The Computer Science department encourages interdisciplinary study in which computer science plays a major role. Advanced courses in other departments that

involve concepts from computer science and are relevant to an individual program may, with permission of the DUS, be counted toward the requirements, but no more than two such courses may be counted toward the B.S., and no more than one toward the B.A.

Students interested in using computers to solve scientific and engineering problems are advised to take CPSC 4371 as well as computational courses offered in Applied Mathematics and in Engineering and Applied Science.

The core mathematical background necessary to complete the Computer Science major is provided in CPSC 2020. However, many advanced courses in graphics, computer vision, neural networks, and numerical analysis assume additional knowledge of linear algebra and calculus. Students who plan to take such courses as electives and who are unsure whether they have the appropriate mathematical background are encouraged to take MATH 2220 or 2250, MATH 2260, and MATH 1200.

Typical programs For students who already know how to program, typical B.S. programs starting in the first and sophomore years are indicated below. For typical B.A. programs, two of the electives would be omitted.

First-Year	**Sophomore**	**Junior**	**Senior**
CPSC 2010	CPSC 2020 and CPSC 3230	Two electives	CPSC 4900
CPSC 2230	CPSC 3650 or 3660	Two electives	One elective
	One elective		

Sophomore	**Junior**	**Senior**
CPSC 2230	CPSC 3650 or 3660	Two electives
CPSC 2010	CPSC 3230	CPSC 4900
CPSC 2020	Two electives	Two electives

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses *B.S.*—12 term courses taken for letter grades (incl senior project); *B.A.*—10 term courses taken for letter grades (incl senior project)

Specific courses required *B.S. and B.A.*—CPSC 2010; CPSC 2020 or MATH 2440; CPSC 2230; CPSC 3230; and CPSC 3650 or 3660.

Distribution of courses *B.S.*—6 addtl intermediate or advanced Comp Sci courses; *B.A.*—4 addtl intermediate or advanced Comp Sci courses

Substitution permitted Advanced courses in other depts, with DUS permission

Senior requirement Senior project (CPSC 4900)

CERTIFICATE IN PROGRAMMING

Certificate director: Ozan Erat, DL 423; cpsc.yale.edu

The Certificate in Programming prepares students to program computers in support of work in any area of study. While the certificate does not provide the grounding in

theory and systems that the computer science majors do, it does provide a short path to programming literacy that can be completed in a span of four terms. Majors in Computer Science, and in the joint programs with Economics, Electrical Engineering, Mathematics, and Psychology, or in Computing and the Arts may not pursue the Certificate.

Refer to the Computer Science website for more information.

PREREQUISITE

The prerequisite for the Certificate is an introductory programming course, CPSC 1100, 1001, S115 or successful completion of an AP Computer Science course.

REQUIREMENTS OF THE CERTIFICATE

See Links to the attributes indicating courses approved for certificate requirements.

Students may not use any of the five required courses, indicated below, to satisfy the requirements of any major or other certificate. If such a course is required for another program, the student must substitute another course from the same category or a more advanced one for the Programming Certificate. No course may be used to satisfy more than one of the five required courses.

Programming One from CPSC 2010 or CPSC 2000

Data structures CPSC 2230

Advanced programming One from CPSC 3270 or CPSC 3230

A programming elective A CPSC course with CPSC 2230 as a listed or implied prerequisite and a primary focus on programming (such as CPSC 4180, 4210, 4230, 4240, 4330, CPSC 4381, 4390, 4460, or 4780) or a second course that satisfies the advanced programming requirement

An applications or algorithms elective Either a programming in context course that requires significant programming (such as CPSC 3340, 3760, 4310, 4320, 4740, 4770, 4790, or LING 3800) or a course in algorithms (such as CPSC 3650 or 3660)

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the certificate.

ADVISING

Ozan Erat from the Department of Computer Science advises students pursuing the Certificate. Exceptions to the requirements, other than the substitution of a more advanced course for a required one, are limited.

SUMMARY OF REQUIREMENTS

Prerequisite CPSC 1100, 1001, S115 or AP Computer Science course

Number of courses 5 term courses

Specific courses required CPSC 2010 or 2000; CPSC 2230; CPSC 3270 or 3230

Distribution of courses 2 electives, as specified

FACULTY OF THE DEPARTMENT OF COMPUTER SCIENCE

Professors Dana Angluin (*Emeritus*), James Aspnes, *Dirk Bergemann, Abhishek Bhattacharjee, Julie Dorsey, Joan Feigenbaum, Michael Fischer, David Gelernter, *Mark Gerstein, Theodore Kim, †Vladimir Rokhlin, Holly Rushmeier, Brian Scassellati, Martin Schultz *(Emeritus)*, Zhong Shao, Avi Silberschatz, †Daniel Spielman, Nisheeth Vishnoi, Y. Richard Yang, Lin Zhong, †Steven Zucker

Associate Professors Yang Cai, Smita Krishnaswamy, Charalampos Papamanthou, Ruzica Piskac, Robert Soulé

Assistant Professors *Kim Blenman, Arman Cohan, Yongshan Ding, Benjamin Fisch, Tesca Fitzgerald, Anurag Khandelwal, Quanquan Liu, Daniel Rakita, Katerina Sotiraki, Marynel Vázquez, Andre Wibisono, Alex Wong, Rex Ying, Manolis Zampetakis, Fan Zhang

Senior Research Scientists Robert Bjornson, Andrew Sherman

Senior Lecturers James Glenn, Scott Petersen, Michael Shah, Stephen Slade

Lecturers Timothy Barron, Andrew Bridy, Xiuye (Sue) Chen, Ozan Erat, Jay Lim, Dylan McKay, Cody Murphey, Sohee Park, Brad Rosen, Inyoung Shin, Alan Weide, Cecillia Xie

*A secondary appointment with a primary affiliation in another department or school.

†A joint appointment with primary affiliation in another department or school.

For a complete list of Computer Science Department personnel, visit the department website.

Computer Science and Economics

Director of undergraduate studies: Philipp Strack (philipp.strack@yale.edu)

Computer Science and Economics (CSEC) is an interdepartmental major for students interested in the theoretical and practical connections between computer science and economics. The B.S. degree in CSEC provides students with foundational knowledge of economics, computation, and data analysis, as well as hands-on experience with empirical analysis of economic data. It prepares students for professional careers that incorporate aspects of both economics and computer science and for academic careers conducting research in the overlap of the two fields. Topics in the overlap include market design, computational finance, economics of online platforms, machine learning, and social media. The CSEC major requires some classes in the intersection between Computer Science and Economics which are not mandatory for either major.

PREREQUISITES

Prerequisite to this major is a basic understanding of discrete math, calculus, microeconomics, and macroeconomics. Grades of 4 or 5 on high-school AP computer science, statistics, calculus, microeconomics, and macroeconomics signal adequate preparation for required courses in the CSEC major. For students who have not taken these or equivalent courses in high school, the discrete mathematics prerequisite may be satisfied with CPSC 2020 or MATH 2440; the calculus prerequisite may be satisfied with MATH 1120; the microeconomics prerequisite may be satisfied with ECON 1110 or ECON 1115; and the macroeconomics prerequisite may be satisfied with ECON 1111 or ECON 1116. Other courses may suffice, and students should consult the director of undergraduate studies (DUS) and their academic advisers if they are unsure whether they have the prerequisite knowledge for a particular required course.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Computer Science and Math Requirements (*YC CSEC Elective not CS or EC*; *YC CSEC Elctv intrsectn CS/EC*).

The B.S. degree program requires successful completion of fourteen term courses (not including courses taken to satisfy prerequisites) and the senior project. Nine of the fourteen courses are listed below; the remaining five courses are electives. With permission of the DUS and the academic adviser, a student may substitute a more advanced course in the same area as a required course. When a substitution is made, the advanced course counts toward the nine required courses and *not* toward the five electives.

The required courses include CPSC 2010; 2230; 3230; 3650 or 3660; ECON 2121 or 2125; two courses in econometrics (ECON 1117 and 2123 or ECON 2135 and ECON 2136); one course in game theory ECON 3351 or CPSC 4550; one course in the intersection of computer science and economics (e.g., CPSC 4550, ECON 4417, 4433, 4486, 4441, 4435, 4478 or CPSC 4740) which may not also count as one of the five remaining electives or for the game theory requirement. S&DS 2410 and 2420 may be taken instead of ECON 2135. Only CPSC 3650 or CPSC 3660 may be taken for major credit.

Elective courses are essentially those courses that count as electives in the Computer Science major, the Economics major, or both. ECON 2122, ECON 2159, and

ECON 6672 can count as Economics electives. S&DS 3650 can count as an elective in a related field. At least two electives must be taken in the Computer Science department, and at least one must be taken in the Economics department. With the permission of the academic adviser, a student may use as the fourth and/or fifth elective (one or two courses) in related departments that do not usually serve as electives in Computer Science or Economics.

Searchable attributes: YC CSEC Elective not CS or EC; YC CSEC Elctv intrsectn CS/EC

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

In the senior year, each student must complete CSEC 4910, a one-term independent-project course that explicitly combines both techniques and subject matter from computer science and economics. A project proposal must be approved by the student's academic adviser and project adviser, and it must be signed by the DUS by the end of the third week of the term.

Distinction in the Major Computer Science and Economics majors may earn Distinction in the Major if they receive grades of A or A– in at least three quarters of their courses in the major (not including courses taken to satisfy prerequisites), and their senior-project advisers determine that their senior projects are worthy of distinction.

ADVISING

Approval of course schedules Students considering the major but not yet declared should arrange to meet with the DUS during the registration period to ensure that their proposed course schedules are appropriate. Similarly, declared majors should meet with their academic advisers to ensure that they are on track to satisfy all of the requirements of the major. Course schedules must be signed by the DUS each term, and they must be approved by an academic adviser before the DUS signs them.

Transfer credit Students who take a term abroad or take summer courses outside of Yale may petition the DUS to count at most two courses from outside Yale toward the requirements of the major. Students who take a year abroad may petition to count at most three courses. Many courses taken outside Yale do not meet the standards of the CSEC major; therefore, students should consult with their academic advisers and the DUS *before* taking such courses. Courses taken outside Yale may not be counted toward the major requirements in intermediate microeconomics, econometrics, or the intersection of computer science and economics.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites Basic knowledge of discrete math, calculus, microeconomics, and macroeconomics; determined by DUS and academic advisers as indicated

Number of courses 14 term courses (not incl prereqs or senior req)

Specific courses required CPSC 2010, 2230, and 3230; CPSC 3650 or 3660; ECON 2121 or 2125; ECON 1117 and 2123 or ECON 2135 and ECON 2136; ECON 3351 or CPSC 4550

Distribution of courses 1 course in intersection of CPSC and ECON, as specified; 5 electives as specified

Substitution permitted S&DS 2410 and 2420 may substitute for ECON 2135; a more advanced course in the same area may substitute for a required course with DUS and academic adviser permission

Senior requirement CSEC 4910

Computer Science and Mathematics

Directors of undergraduate studies: Theodore Kim (theodore.kim@yale.edu) (Computer Science), AKW 208A, 432-6400; Sebastian Hurtado-Salazar (Mathematics), Miki Havlickova (Mathematics); Math DUS email (math.dus@yale.edu)

Computer Science and Mathematics is an interdepartmental major for students who are interested in computational mathematics, the use of computers in mathematics, mathematical aspects of algorithm design and analysis, and theoretical foundations of computing.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Computer Science and Math major requirements.

The major requires fourteen term courses as well as a senior project. Six of the fourteen courses must be in computer science: CPSC 2010; CPSC 2230; CPSC 3230; and CPSC 3650 or 3660; one advanced course with significant mathematical content; and one additional advanced course other than CPSC 4900. Only one of CPSC 3650 and 3660 may be taken for major credit. The remaining eight courses must be in mathematics: MATH 1200, either MATH 2250 or 2260, MATH 2440, and five additional term courses numbered 2250-4690.

With prior written permission from the Mathematics DUS, students who completed multivariable calculus during high school may substitute a higher level mathematics course in the same area for MATH 1200.

A course must be listed with a MATH number to count toward the mathematics requirements and must be listed with a CPSC number to count toward the computer science requirements—substitutions from other departments are not allowed. Graduate mathematics courses level 5000-5999 may be counted as electives; graduate mathematics courses level 6000 or above may not be counted.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken after matriculation at Yale at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The senior requirement is a project or an essay on a topic acceptable to both departments. Students typically enroll in CPSC 4900 or MATH 4750. Permission must be obtained in writing from the director of undergraduate studies (DUS) of both departments before embarking on the project or the essay.

ADVISING

The entire program of each student majoring in Computer Science and Mathematics must be approved by the DUS in each department.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 14 term courses, 6 in computer science and 8 in math (not incl senior req)

Specific courses required CPSC 2010; CPSC 2230; CPSC 3230; CPSC 3650 or 3660; MATH 1200; MATH 2250 or 2260; MATH 2440

Distribution of courses 2 addtl courses in computer science with 1 adv course with significant mathematical content and 1 adv course other than CPSC 4900; 5 addtl courses in math numbered 2250-4690 (may not include MATH 4700, or MATH 4800 through MATH 4890)

Senior requirement CPSC 4900 or MATH 4750

Computer Science and Psychology

Directors of undergraduate studies: Theodore Kim (theodore.kim@yale.edu) (Computer Science); Yarrow Dunham (Psychology)

Computer Science and Psychology is an interdepartmental major designed for students interested in integrating work in these two fields. Each area provides tools and theories that can be applied to problems in the other. Examples of this interaction include cognitive science, artificial intelligence, and biological perception.

PREREQUISITE

The prerequisite for the major is PSYC 1100, from which students who have scored 5 on the Advanced Placement test in Psychology are exempt. Beyond the prerequisite, the major requires fourteen term courses as well as a senior project.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the Psychology DUS, the following requirements (specifically the elimination of PSYC 2100 as a requirement), updated for the academic year 2025-2026, may be fulfilled by students who declared the major in a prior term.

See Links to attributes indicating courses approved for Psychology major requirements.

Eight of the fourteen required courses must be in computer science: CPSC 2010, 2020, 2230, 3230, and CPSC 3650 or 3660, and three advanced computer science courses in artificial intelligence (examples of such courses are those in the range CPSC 4700–CPSC 4770, CPSC 4520, 4530, CPSC 4810–4890). CPSC 2800 and 4900 may not be counted as one of these courses. MATH 2440 may substitute for CPSC 2020. Only one of CPSC 3650 and 3660 may be taken for major credit.

The remaining six courses for the psychology requirement include one course in statistics, either S&DS 1000 or S&DS 2300, and at least one course in research methods from PSYC 2100–2990; at least two psychology courses from the social science point of view; and at least two courses from the natural science point of view. At least one of the two psychology courses from both the social science point of view and the natural science point of view must be designated as Core in the course listings. Refer to the Psychology program overview for a listing of courses that fulfill the social science and natural science requirements and a description of courses designated as Core.

With the permission of both directors of undergraduate studies (DUSs), a course in cognitive psychology or cognitive science that is highly relevant to the major and that is not counted as one of the six courses in psychology may substitute for one of the courses in artificial intelligence.

Credit/D/Fail No course in Computer Science taken Credit/D/Fail may be applied toward the requirements of the major; no more than one course in psychology taken Credit/D/Fail may be applied toward the major requirements. No 200-level course in psychology taken Credit/D/Fail may be applied toward the major requirements.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students must take either CPSC 4900 or PSYC 4990, and the project must be approved by the DUS in each department.

ADVISING

The entire program of each student majoring in computer science and psychology must be approved by the DUS in each department.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite PSYC 1100

Number of courses 14 term courses beyond prereq (not incl senior project)

Specific courses required CPSC 2010, 2020, 2230, 3230, and CPSC 3650 or 3660; S&DS 1000 or S&DS 2300

Distribution of courses 3 CPSC advanced AI courses; 6 PSYC courses to include 1 statistics course and at least 1 course from PSYC 2100–2990; at least 2 from social science point of view and 2 from natural science point of view, with 1 designated Core course from each, as specified

Substitution permitted With permission of both DUSs, and as specified: MATH 2440 for CPSC 2020; 1 relevant course in cognitive psychology or cognitive science for 1 course in AI

Senior requirement CPSC 4900 or PSYC 4990, with project approved by DUS in each dept

Computing and Linguistics

Director of undergraduate studies: Simon Charlow (simon.charlow@yale.edu) (Linguistics); Computing and Linguistics website

The Computing and Linguistics major provides multidisciplinary training in the computational study of human language, the development of systems for natural language processing, and the automated analysis of textual data in applications in the humanities, social sciences, and sciences. Students learn the foundational tools and methods that underlie this work, including areas of computer science, statistics and data science, and linguistics, and apply them to some empirical domain, through coursework and an independent research project in the senior year.

The B.A. in Computing and Linguistics exposes students to the fundamental ideas and foundational techniques of the field, while the B.S. provides more extensive training and engagement in research, preparing students for graduate work in the area.

PREREQUISITES

There are three prerequisites for this major and they fall in three areas of study: (1) *statistics*, satisfied through S&DS 1000, or 1230, or 2200, or comparable background in statistics (e.g., through a score of 5 on the AP Statistics exam) as approved by the director of undergraduate studies (DUS); (2) *programming*, satisfied through an appropriate introductory programming course or comparable experience as approved by the DUS; and (3) *linguistics*, satisfied through one 1000-level Linguistics course. It is also advisable that students have some background in single-variable calculus, before beginning this major.

REQUIREMENTS OF THE MAJOR

See Link to the *YC CPLI Elective in CP & Ling* attribute indicating courses approved for the major requirements.

B.A. degree program The B.A. degree program requires 11 term credits beyond the prerequisites and not including the senior requirement. Core courses, as listed below, are required from the following categories: 2 math core courses; 1 statistics core course (S&DS 2380); 2 linguistics core courses; 2 computation core courses; 3 advanced courses; 1 elective, and 1 senior requirement course.

B.S. degree program The B.S. degree program requires 14 term credits beyond the prerequisites and not including the senior requirement. Core courses, as listed below, are required from the following categories: 2 math core courses; 2 statistics core courses; 3 linguistics core courses; 2 computation core courses; 3 advanced courses; 2 electives, and 2 senior requirement courses.

Math core courses Both B.A. and B.S. degree students must take one course in proof-based discrete mathematics (one of MATH 2440, LING 2249, or CPSC 2020) and one course in linear algebra (either MATH 2220 or MATH 2250).

Statistics core courses These provide foundations in probability and statistical theory. B.A. degree students satisfy this requirement by taking S&DS 2380; B.S. degree students choose between two options (1) one of S&DS 2400 or S&DS 2410, together

with S&DS 2420; (2) S&DS 2380 and either S&DS 2300 or any S&DS course numbered 2420 or above.

Linguistics core courses These courses, LING 2320, 2530, and 2630, expose students to the nature of linguistic structure and its variability across languages, at the level of sound (phonology), form (syntax) and meaning (semantics). B.A. degree students must take 2 out of these 3 courses, while B.S. degree students must take all 3.

Computation core courses Computational studies of language rest crucially on the foundations of computer science and programming. To this end, both B.A. and B.S. degree students must take CPSC 2010 and 2230.

Advanced courses Both B.A. and B.S. degree students must take 1 advanced course in linguistic structure, either LING 3350, 3540, or 3640; 1 course in natural language processing, either CPSC 4770 or LING 2270; and 1 course in machine learning, either S&DS 2650, 3650, or CPSC 3810.

Electives Elective courses may be used to explore the application of the techniques of computational linguistics across a range of disciplines or to deepen expertise in these techniques. Courses that are pre-approved to satisfy the elective requirement are listed on the Computing and Linguistics major website, but other relevant courses may satisfy this requirement with DUS approval. B.A. degree students take 1 elective course; B.S. degree students take 2 electives.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major (other than as prerequisites).

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

All Computing and Linguistics majors enroll in the capstone seminar CSLI 4900 in the fall of the senior year. This seminar includes discussion of student research, as well as presentations by researchers in the field from both inside and outside of Yale. B.A. degree students complete a senior project as part of CSLI 4900, working either on an independent project supervised by a Yale faculty member with relevant expertise or as part of a group effort of capstone seminar participants. B.S. degree students enroll in the capstone seminar in the fall and continue work on their senior project in the spring. The senior project of B.S. degree students must involve independent research.

ADVISING

Students interested in the Computing and Linguistics major are encouraged to consult with the DUS. Further information about the major and answers to FAQs are available on the Computing and Linguistics website. The entire selection of courses by students in the major must be approved by the DUS.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites *Statistics*: one of S&DS 1000, 1230, or 2200 or comparable experience; *Programming*: introductory programming course or comparable experience; *Linguistics:* one 1000-level LING course

Number of courses *B.A.* degree—11 term credits beyond prereqs and not incl senior req; *B.S. degree*—14 term credits beyond prereqs and not including senior req

Specific courses required *For both degrees*—2 computational core courses: CPSC 2010 and CPSC 2230; for *B.A. degree*—S&DS 2380

Distribution of courses *Both degrees*—2 math core courses, 1 adv linguistics structure course, 1 adv natural language processing course, 1 adv course in machine learning; *B.A. degree*—2 linguistics core courses, 1 elective*; B.S. degree*—2 statistics core courses, 3 linguistics core courses, 2 electives

Substitution permitted Elective courses in computational linguistics, machine-learning and applications of computational linguistics, as approved by DUS

Senior requirement *Both degrees*—Capstone seminar CSLI 4900; *B.S. degree*—one additional semester of senior project

Computing and the Arts

Director of undergraduate studies: Scott Petersen (scott.petersen@yale.edu)

Computing and the Arts is an interdepartmental major designed for students who wish to integrate work in computing with work in one of five arts disciplines: architecture, art, history of art, music, or theater, dance, and performance studies.

For students with a computing perspective, issues in these disciplines present interesting and substantive problems: how musicians use computers to compose; the limitations of current software tools used by artists; the types of analyses done by art historians; challenges in designing and using virtual sets in the theater; ways that virtual worlds might help to envision new forms of artistic expression; and lessons that can be learned from trying to create a robotic conductor or performer.

For students with an artistic perspective, computing methods offer a systematic approach to achieving their vision. A foundation in computer science allows artists to understand existing computing tools more comprehensively and to use them more effectively. Furthermore, it gives them insight into what fundamentally can and cannot be done with computers, so they can anticipate the future development of new tools for computing in their field.

PREREQUISITES

The prerequisite for all students in the major is CPSC 1001 which should be taken during the first year. There are two additional prerequisites for the Art concentration, ART 1111 and ART 1514. There are two additional prerequisites for the Theater, Dance, and Performance Studies concentration, TDPS 1000 and TDPS 1001. There are no additional prerequisites for the Architecture, History of Art, or Music concentrations. There is no required favorable review of studio work for admission to the major in any concentration, but a sophomore review advising session is required for the Art concentration.

REQUIREMENTS OF THE MAJOR

See Links to attributes indicating Computer Science courses approved for Computing and the Arts major requirements.

Twelve term courses are required beyond the prerequisites, not including the two-term senior project. Six of the courses must be in Computer Science, including CPSC 2010, 2020, and 2230. Students are advised to complete CPSC 2020 and 2230 by the end of the sophomore year. MATH 2440 may be substituted for CPSC 2020. The six remaining courses are selected from one of the arts disciplines. Students choose a concentration in architecture, art, history of art, music, or theater, dance, and performance studies. All requirements for a single concentration must be satisfied, as specified below.

The Architecture concentration requires the following courses in addition to the Computer Science courses listed above: (1) ARCH 1001 and ARCH 2000; (2) two courses from ARCH 2001, 2003, 3304, and 3305; (3) two elective courses from either of the two Architecture specific concentrations: Design; or History, Theory, Criticism of Architecture, and Urbanism; (4) two courses from CPSC 3760, CPSC 4381, 4460, 4510, 4750, 4780, 4790, or 4840; and (5) one additional intermediate or advanced CPSC course (excluding CPSC 4900).

The Art concentration requires the following courses in addition to the Computer Science courses listed above, as well as a sophomore review at the School of Art: (1) two 1000-level courses beyond ART 1111 and ART 1514, such as ART 1732 and/or ART 1784 or ART 1985; (2) two courses in Art at the 2000 or 3000 level, such as ART 2985 and/or ART 3770; (3) ART 3995; (4) ART 4995; (5) two courses selected from CPSC 3760, CPSC 4381, 4460, 4510, 4750, 4780, 4790, or 4840; (6) one additional intermediate or advanced Computer Science course (excluding CPSC 4900). Seniors following the art concentration will have access to a shared studio and many facilities in the School of Art.

The History of Art concentration requires the following courses in addition to the Computer Science courses listed above: (1) one introductory, 1000-level, History of Art course; (2) two History of Art courses at the 2000, 3000, or 4000 level (the courses must represent two different areas as defined in the History of Art program description); (3) one studio art course (students may need to take a prerequisite course in Art to prepare for the studio course); (4) HSAR 4401; (5) one 4000-level seminar in History of Art; (6) two courses selected from CPSC 3760, CPSC 4381, 4510, 4750, 4780, or 4790, one of which must be CPSC 4780 or 4790; (7) one additional intermediate or advanced Computer Science course (excluding CPSC 4900).

The Music concentration requires the following courses in addition to the Computer Science courses listed above: (1) two courses from *Group I* (Music Theory); (2) three additional courses from *Group I* or *Group II* (Creative Practices); (3) one course from *Group III* (Western Art Music) or *Group IV* (World and Popular Music); (4) CPSC 4310; (5) CPSC 4320; (6) one additional intermediate or advanced Computer Science course (excluding CPSC 4900).

The Theater, Dance, and Performance Studies concentration requires the following courses in addition to the prerequisites and Computer Science courses listed above: (1) one course in the Artistic Practice domain; (2) one course in the Histories domain; (3) one course in the Performance Theory domain; (4) one course in the Interarts domain; (5) two additional courses in any of the domains; (6) CPSC 4310 or 4320; (7) CPSC 4780, 4790, or CPSC 4840; (8) one additional intermediate or advanced Computer Science course (excluding CPSC 4900).

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The senior project requires two terms: one term of CPSC 4900, and one term of ARCH 4910, ART 4996, HSAR 4499, one from MUSI 4996–4999, or one from TDPS 4701, 4900 or 4901, depending on the concentration chosen. The project must be approved by the DUS and be acceptable to both departments. Students must submit a written report, including an electronic abstract and webpage(s).

ADVISING AND APPROVAL OF PROGRAM

The entire program of each student majoring in Computing and the Arts must be approved by the DUS.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites *All concentrations*—CPSC 1001; *Art concentration*—ART 1111, ART 1514, and sophomore review; *Theater, Dance, and Performance Studies concentration*—TDPS 1000, TDPS 1001

Number of courses 12 term courses beyond prereqs (not incl senior project)

Specific courses required *All concentrations*—CPSC 2010, 2020, 2230; *Architecture*—ARCH 1001, ARCH 2000; 2 courses from ARCH 2001, 2003, 3304, 3305; *Art*—ART 3995, ART 4995; *History of Art*—HSAR 4401; *Music*—CPSC 4310, 4320; *Theater, Dance, and Performance Studies*—CPSC 4310 or 4320; CPSC 4780, 4790, or CPSC 4840

Distribution of courses *All concentrations*—3 addtl courses in Comp Sci as specified for each concentration, to incl 1 intermediate or advanced course (excluding CPSC 4900); *Architecture*—2 courses from the Architecture specific concentrations, as specified; *Art*—2 courses in Art at 1000 level (excluding prereqs), 2 courses at 2000 or 3000 level; *History of Art*—1 intro, 1000-level course; 2 courses in different areas of History of Art at 2000, 3000, or 4000 level, as specified; 1 sem at 4000-level in History of Art; 1 studio art course; *Music*—2 courses from *Group I* (Music Theory); 3 courses from *Group I* or *Group II* (Creative Practices); (3) one course from *Group III* (Western Art Music) or *Group IV* (World and Popular Music); *Theater, Dance, and Performance Studies*—1 course in each of 4 domains; 2 additional courses in any domain

Substitution permitted MATH 2440 for CPSC 2020

Senior requirement *All concentrations*—Two-term senior project including CPSC 4900, approved by DUS; *Architecture*—ARCH 4910; *Art*—ART 4996; *History of Art*—HSAR 4499; *Music*—one from MUSI 4996–4999; *Theater, Dance, and Performance Studies*—TDPS 4701, 4900 or 4901

DeVane Lecture Course

A DeVane lecture course will be offered during fall 2025, *America at 250: A History,* jointly taught by Professors Joanne Freeman, David Blight, and Beverly Gage. For more information, *see* Yale Course Search.

Directed Studies

Director of undergraduate studies: Katja Lindskog (katja.lindskog@yale.edu), HQ (320 York St.); Chair of Humanities: Pauline LeVen, HQ (320 York St.); directedstudies.yale.edu

Directed Studies (DS), a selective program for first-year students, is an interdisciplinary introduction to influential texts that have shaped many Western and Near Eastern traditions, spanning from cultures in the Ancient Mediterranean to the present. Directed Studies is a coherent program of study that encourages students to put rich and complex texts into conversation with one another across time and across disciplinary boundaries. Students in Directed Studies learn to analyze challenging and urgent texts, to participate meaningfully in seminar discussions, and to write clear and persuasive analytic essays.

PREREQUISITES

Directed Studies has no prerequisites and is designed for students with or without any background in humanities or Western thought, ancient or modern. Students must enroll in the full slate of Directed Studies courses in both semesters of the program. (In order to enroll for the second term, students must have completed the first term's courses.)

UNIQUE TO THE PROGRAM

The Directed Studies program consists of three integrated full-year courses in Literature, Philosophy, and Historical and Political Thought. Approximately ten percent of the first-year class are accepted each year. Students entering the program must enroll in all three courses and are expected to enroll for both semesters. Students participating in DS become members of a close-knit and supportive intellectual cohort that endures well beyond the end of the first year.

Each of the three Directed Studies courses meets weekly for two seminars and one lecture. Seminars have a maximum of fifteen students and provide an opportunity to work closely with Yale faculty. The regular lectures and seminars are complemented by guest lectures that feature distinguished speakers from Yale and beyond. Our study of written texts is enhanced by special sessions at the Yale Art Gallery, the Yale Center for British Art, and the Beinecke Rare Book and Manuscript Library.

Directed Studies fulfills a number of Yale College distributional requirements, including the two required course credits in the humanities and arts (HU), the two required course credits in the social sciences (SO), and the two required course credits in writing (WR). Moreover, courses taken in Directed Studies can be counted toward satisfying requirements in a variety of majors. For example, both terms of DS Historical and Political Thought may be counted toward the History major, and one term may be counted toward the major in Political Science; both terms of DS Literature may be counted toward the Comparative Literature major. The program serves as a strong foundation for all majors in Yale College, including many STEM fields, and is an outstanding basis for careers in law, public policy, business, education, the arts, journalism, consulting, engineering, and medicine.

Earth and Planetary Sciences

Directors of undergraduate studies: Celli Hull (pincelli.hull@yale.edu); earth.yale.edu

The Earth and Planetary Sciences (EPS) program, formerly Geology and Geophysics, prepares students for the application of scientific principles and methods to the understanding of the Earth system and other planets. Subjects range from the history of Earth and life to present-day environmental processes and climate change, the deep interiors of Earth and other planets, tectonic plates, oceans, atmospheres, climates, land surface, natural resources, and biota. The emphasis of the curriculum is on employing basic principles from the core sciences (physics, chemistry, and biology) to further an understanding of Earth's past and present, and addressing issues relating to its future. Students gain a broad background in the natural sciences, and select a specific concentration to focus their work on planetary or environmental phenomena of particular interest. The four B.S. degree concentrations emphasize hands-on research experience in fieldwork, in laboratories, or in theoretical analyses and computer modeling. While some graduates continue on to research, consulting, or industrial careers in Earth, environmental, and planetary sciences, the major's broad scientific training prepares students for a wide variety of other paths, including medicine, law, public policy, and teaching. There is also a B.A. degree, which is most suitable for students who wish to study Earth and Planetary Sciences as a second major, complementing other majors in, for example, mathematics, economics, physics, biology, or engineering, and who do so in preparation for a career in law, business, government, or environmental fields.

PREREQUISITES

With permission of the director of undergraduate studies (DUS), acceleration credits awarded at matriculation for high scores on national or international examinations (such as Advanced Placement subject tests) may be used to satisfy prerequisites, even if the student does not choose to accelerate. Higher-level courses may, with the permission of the DUS, be substituted for prerequisites and for specific required courses. For prerequisites specific for each concentration, see Requirements of the Major.

REQUIREMENTS OF THE MAJOR

B.A. degree program The B.A. degree in Earth and Planetary Sciences requires fewer upper-level courses than the B.S. degree. It may be more appropriate for students who plan to fulfill the requirements of two majors, who study Earth and Planetary Sciences in preparation for a career in law, business, government, or environmental fields, or who decide to pursue a science major only after the first year. The prerequisites include mathematics (MATH 1150), biology (BIOL 1010 and BIOL 1020 or EPS 2550), or physics (PHYS 1700, 1710; or PHYS 1800, 1810; or PHYS 2000, 2010), and a lecture course in chemistry. The major requirements consist of at least nine term courses for at least nine credits, beyond the prerequisites. These include two courses in EPS numbered 1000–1400, with any accompanying laboratories; courses in natural resources (EPS 2740 or EPS 2750 and geochemical processes (EPS 2200 or EPS 2320 or EPS 2610 or EPS 3100); and five additional courses at the 2000 level or higher in Earth and Planetary Sciences or related fields, approved by the DUS and including either

the senior essay or the senior thesis. Course selections can be guided by any of the B.S. concentrations described above.

B.S. degree program Majors in the B.S. program in Earth and Planetary Sciences choose from four concentrations: Atmosphere, Ocean, and Climate; Environmental and Energy Geoscience; Paleontology and Geobiology; and Solid Earth Science. The concentrations are suggested pathways to professional careers and major areas of research in earth and planetary sciences. Students may change concentrations during their course of study with guidance from the DUS.

1. The Atmosphere, Ocean, and Climate concentration provides a comprehensive understanding of the atmosphere-ocean-climate system. Topics range from past climate changes, including the ice ages, to present-day atmospheric and ocean circulation, to weather phenomena, to global warming projections. The prerequisites are CHEM 1650 or CHEM 1670; PHYS 1800, 1810 and PHYS 2050L, 2060L; ENAS 1300 or equivalent; and mathematics through differential equations (MATH 1200 or ENAS 1510, and ENAS 1940). The major requirements consist of at least eleven term courses, for at least eleven course credits, beyond the prerequisites, including either the senior essay or the senior thesis. To begin study of Earth processes, majors take an introductory course in EPS, selected from EPS 1000; EPS 1010; EPS 1100 with 1110L; or EPS 1250 with 1260L. EPS 1000 and 1010 do not require an accompanying lab. Five core courses, totaling five course credits, introduce students to Earth's climate system (EPS 1400), meteorology (EPS 3220), physical oceanography (EPS 3350), fluid mechanics (MENG 3422), and statistics or linear algebra (S&DS 2300 or 2380 or MATH 2220). Other higher-level courses in EPS can be substituted with the permission of the DUS. Four electives are chosen from topics in the environment and in processes that govern the atmosphere, ocean, and land surface, physics, and statistics. A list of suggested electives is available from the office of the DUS or on the department website. At least one elective must be from EPS.
2. The Environmental and Energy Geoscience concentration provides a scientific understanding of the natural and anthropogenic processes that shape the Earth-atmosphere-biosphere system, including energy and material flows among its components. It emphasizes comparative studies of past and current Earth processes to inform models of humankind's role within the environment's future. The prerequisites are broad and flexible and include CHEM 1650 or CHEM 1670 and mathematics through multivariate calculus (MATH 1200 or ENAS 1510). Depending on their area of focus, students may choose a prerequisite in physics (PHYS 1700, 1710; or PHYS 1800, 1810; or PHYS 2000, 2010), or they may choose cellular biology (BIOL 1010 and 1020, or MCDB 120) and evolutionary biology (BIOL 1030 and 1040 or EPS 1250 and 1260L). The major requirements consist of at least eleven term courses, for at least eleven course credits, beyond the prerequisites, including either the senior essay or the senior thesis. To begin study of the Earth system, majors take two introductory courses in EPS, selected from EPS 1000; EPS 1010; EPS 1100 with 1110L; EPS 1250 with 1260L; or EPS 1400. Four core courses are chosen from Earth's surface processes (EPS 2320), the microbiology of surface and near-surface environments (EPS 2550), fossil fuels and energy transitions (EPS 2740), renewable energies (EPS 2750), geochemical principles (EPS 3100), geology (EPS 2100 or EPS 2200 or EPS 3120), meteorology

(EPS 3220), and satellite-based image analysis (EPS 3620). Other higher-level courses in EPS can be substituted with the permission of the DUS. Four electives chosen from Earth & Planetary Sciences, Environmental Studies, Ecology and Evolutionary Biology, Engineering, or related fields provide a broad approach to scientific study of the environment. A list of suggested electives is available from the office of the DUS or on the department website. Electives may be chosen from the core courses, and at least two must be from EPS.

3. The Paleontology and Geobiology concentration focuses on the fossil record of life and evolution, geochemical imprints of life, and interactions between life and Earth. Topics range from morphology, function, relationships, and biogeography of the fossils themselves, through the contexts of fossil finds in terms of stratigraphy, sediment geochemistry, paleoecology, paleoclimate, and geomorphology, to analysis of the larger causes of paleontological, geobiological, and evolutionary patterns. Integrative approaches are emphasized that link fossil evidence with the physical and chemical evolution of Earth. The prerequisites are college-level biology (BIOL 1010–1040), or CHEM 1650 or CHEM 1670, and mathematics through multivariate calculus (MATH 1200 or ENAS 1510). The major requirements consist of at least twelve term courses, for at least eleven and a half course credits, beyond the prerequisites, including either the senior essay or the senior thesis. Students take one of EPS 1000; EPS 1010; or EPS 1100 with 1110L, to gain geological and environmental context, and they also take EPS 1250 and 1260L as an introduction to the fossil record and evolution. Four core courses are chosen from topics in four of the following areas: in sedimentary processes (EPS 2320 or EPS 3550), the study of evolution (EEB 2225), vertebrates and vertebrate paleontology (EPS 2700 or EPS 3250 or EPS 3750), invertebrate paleontology (EPS 3130), paleoecology (EPS 3450), microbiology in past and present environments (EPS 2550), Earth's carbon cycle and climate (EPS 3100 or 4020), and statistical data analysis as applied to the life sciences. Other higher-level courses in EPS can be substituted with the permission of the DUS. Four electives selected from Earth and Planetary Sciences, Ecology and Evolutionary Biology, Molecular, Cellular, and Developmental Biology, and related fields offer students flexibility in pursuing their specific interests. A list of suggested electives is available from the office of the DUS or on the department website. At least four of the twelve term courses should be upper level (2000 or above) paleontology courses and at least one elective must be from EPS.
4. The Solid Earth Science concentration emphasizes an integrated geological, geochemical, and geophysical approach to the study of processes operating within Earth and their manifestations on the surface. It includes the structure, dynamics, and kinetics of Earth's interior and their impacts on our environment both in the long term (e.g., the evolution of the land surface) and in the short term (e.g., the causes of natural disasters such as earthquakes, tsunamis, and volcanic eruptions). Students acquire a fundamental understanding of the solid Earth system, both as it exists today and as it has evolved over geologic timescales. The prerequisites are CHEM 1650 or CHEM 1670, physics (PHYS 1700, 1710; or PHYS 1800, 1810; or PHYS 2000, 2010), and mathematics through multivariate calculus (MATH 1200 or ENAS 1510). The major requirements consist of at least eleven courses, for at least eleven course credits, beyond the prerequisites, including either the senior essay or the senior thesis. To begin study of the Earth system, majors take two

introductory courses in EPS, selected from EPS 1000; EPS 1010; EPS 1100 with 1110L; EPS 1250 with 1260L; or EPS 1400. The core of the concentration consists of four courses chosen from topics in mountain building and global tectonics (EPS 2100 or EPS 2120 or EPS 3500), rocks and minerals (EPS 2200), sedimentary rocks and processes (EPS 2320), isotope geochemistry (EPS 3100), and structural geology (EPS 3120). Other higher-level courses in EPS can be substituted with the permission of the DUS. Students also select four electives in geology, geochemistry, geophysics, or related topics. A list of suggested electives is available from the office of the DUS or on the department website. Electives may be chosen from core courses, and at least two must be from EPS.

Credit/D/Fail No course taken Credit/D/Fail may be applied to the prerequisites or the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Seniors in both degree programs must prepare either a senior essay based on one term of library, laboratory, or field research (EPS 4920) or, with the consent of the faculty, a two-term senior thesis (EPS 4900, EPS 4910), which involves innovative field, laboratory, or theoretical research. Students electing to do a senior thesis must first select a topic and obtain the consent of a faculty member to act as an adviser. They must then petition the faculty through the DUS for approval of the thesis proposal. The petition should be submitted by the start of the senior year. If the two-term senior thesis is elected, EPS 4910 may count as an elective toward the major. A copy of each senior thesis or senior essay is made available on the department website.

ADVISING

Qualified juniors and seniors are encouraged to enroll in graduate courses, with permission of the instructor, the DUS, and the director of graduate studies. Descriptions of graduate courses are available at the office of the DUS.

Practical experience In addition to prerequisites and required courses in Earth and Planetary Sciences, candidates for the B.A. and B.S. degrees are strongly encouraged to gain practical experience. This can be done in two ways: (1) by attending a summer field course at another academic institution, or (2) by participating in summer research opportunities offered by the Department of Earth and Planetary Sciences, by other academic institutions, or by certain government agencies and private industries. Consult the DUS or see the department website for further information.

Combined B.S./M.S. degree program Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in Earth and Planetary Sciences.

Physics and Geosciences major The Department of Earth and Planetary Sciences also offers a combined major with the Department of Physics. For more information, see Physics and Geosciences.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites *B.A.*—MATH 1150; biology (BIOL 1010 and 1020, or EPS 2550) or physics (PHYS 1700, 1710; or PHYS 1800, 1810; or PHYS 2000, 2010); and a lecture course in chem; *B.S.*—*All concentrations*—CHEM 1650 or CHEM 1670; MATH 1200 or ENAS 1510; *Atmosphere, Ocean, and Climate concentration*—ENAS 1300 or equivalent; ENAS 1940; PHYS 1800, 1810, 2050L, 2060L; *Environmental and Energy Geoscience concentration*—physics (PHYS 1700, 1710, or PHYS 1800, 1810, or PHYS 2000, 2010) or biology (BIOL 1010 and 1020; and BIOL 1030 and 1040, or EPS 1250 and EPS 1260L); *Paleontology and Geobiology concentration*—BIOL 1010–1040; *Solid Earth Science concentration*—PHYS 1700, 1710, or PHYS 1800, 1810, or PHYS 2000, 2010

Number of courses *B.A.*—at least 9 courses beyond prereqs for letter grades (incl senior req); *B.S.*—*Atmosphere, Ocean, and Climate, Environmental and Energy Geoscience,* and *Solid Earth Science concentrations*—at least 11 courses, for 11 credits, beyond prereqs for letter grades (incl senior req); *Paleontology and Geobiology concentration*—at least 12 courses, for 11.5 credits, beyond prereqs for letter grades (incl senior req)

Specific core courses *B.A.*—EPS 2740 or EPS 2750; 1 from EPS 2200, 2320, 2610, or 3100; *B.S.*—*Atmosphere, Ocean, and Climate concentration*—EPS 1400, 3220, 3350, MENG 3422, S&DS 2300 or 2380 or MATH 2220; *Paleontology and Geobiology concentration*—EPS 1250, 1260L

Distribution of courses *B.A.*—2 intro courses in EPS, with labs; 5 addtl courses at 2000 level or higher in EPS or related fields inc sen req; *B.S. concentrations*—1 or 2 intro courses in EPS, with labs, as specified; 4 or 5 core courses, as specified; 4 electives, as specified

Substitution permitted *All programs*—with DUS permission, higher-level courses for prereqs or core courses

Senior requirement *All programs*—senior essay (EPS 4920) or, with permission of faculty, two-term senior thesis (EPS 4900, 4910)

FACULTY OF THE DEPARTMENT OF EARTH AND PLANETARY SCIENCES

Professors Jay Ague, David Bercovici, Ruth Blake, Mark Brandon, Derek Briggs, David Evans, Alexey Fedorov, Debra Fischer, Jacques Gauthier, Shun-ichiro Karato, Jun Korenaga, Maureen Long (*Chair*), Jeffrey Park, Noah Planavsky, Peter Raymond, Danny Rye (*Emeritus*), James Saiers, Ronald Smith (*Emeritus*), Mary-Louise Timmermans, John Wettlaufer

Associate Professors Bhart-Anjun Bhullar, Matthew Eisaman, Pincelli Hull

Assistant Professors Juan Lora, Alan Rooney, Lidya Tarhan, Jordan Wostbrock

Lecturer Michael Oristaglio

East Asian Languages and Literatures

Director of undergraduate studies: Pauline Lin (pauline.lin@yale.edu); eall.yale.edu

The major in East Asian Languages and Literatures provides rigorous training in the study of East Asian languages, literatures, cultures, and thought from ancient times through the present, with a strong focus on the reading and analysis of texts, theater, film, and other forms of media. Students select either the Chinese, Japanese, or Korean concentration but are encouraged to take courses across geographical regions to become familiar with East Asian literary culture more broadly. The major is excellent preparation for careers including law, business, academia, foreign service, translation, and journalism that demand advanced linguistic proficiency and analytical sophistication. East Asian Languages and Literatures graduates have gone on to careers in law, business, academia, medicine, film, translation, teaching, and diplomacy.

COURSES FOR NONMAJORS

All courses offered by the Department of East Asian Languages and Literatures are open to nonmajors.

COURSE NUMBERING

Language courses use the subject codes CHNS, JAPN, or KREN. Multiple-titled courses that include CHNS, JAPN, or KREN subject codes and are numbered 2000–2999 are taught in English with some sections taught in Chinese, Japanese, or Korean. Courses with the subject code EALL are content courses whose focus is critical and humanistic; those numbered 2000–2999 are introductory, and those numbered 3000–3999 are advanced. Courses numbered EALL 0001–0099 are First-Year Seminars with topics on East Asian literature, film, and humanities.

PREREQUISITE

Candidates for the major must complete CHNS 1400, JAPN 1400, KREN 1400, or the equivalent.

PLACEMENT PROCEDURES

Students who enroll in the department's language courses for the first time but who have studied Chinese, Japanese, or Korean elsewhere, and students who have skills in one of these languages because of family background, must take a placement examination before the beginning of the academic year. These exams can be accessed via the department website and must be completed before the end of July. Students of Japanese, Chinese, and Korean languages, returning from programs abroad, must take a placement examination, unless the coursework was completed at an institution pre-approved by the Richard U. Light Fellowship program. For questions, consult with the director of undergraduate studies (DUS).

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the director of undergraduate studies (DUS), the following requirements, updated for the academic year 2024-2025, may be fulfilled by students who declared the major in a prior term. A Korean concentration was added to the Chinese and Japanese concentrations.

The major consists of at least eleven term courses beyond the prerequisite. Students must take two terms of advanced modern Chinese (CHNS 1500 and 1510 or equivalents), advanced Japanese (JAPN 1500 and 1510 or equivalents), or advanced Korean (KREN 1500 and 1510 or equivalents) as well as one term of literary Chinese (CHNS 1700), literary Japanese (JAPN 1700), or Introduction to Hanja (KREN 1700). Students also take a survey course in Chinese, Japanese, Korean, or East Asian history and culture, preferably early in their studies. Three courses are required in literature in translation, taught in English, selected from EALL 2000–3999; one must be focused primarily on premodern content. These three may include courses on theater and film. In addition, three advanced courses with readings in literary or modern Chinese, Japanese, and/or Korean are required.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major, with permission of the DUS.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students prepare a one-term senior essay in EALL 4910 or a yearlong senior essay in EALL 4920 and 4930. Those who elect a yearlong essay effectively commit to taking twelve term courses in the major, because the second term of the essay may not be substituted for any of the eleven required courses.

STUDY ABROAD

Students are encouraged to study abroad. Interested students should consult with the DUS and with the office of the Richard U. Light Fellowship to apply for support for programs in China, Japan, and Korea.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite CHNS 1400, JAPN 1400, KREN 1400, or equivalent

Number of courses 11 courses (incl one-term senior essay) or 12 courses (incl yearlong senior essay) beyond prerequisite

Specific courses required *Chinese concentration*—CHNS 1500, 1510 or equivalents, and 1700; *Japanese concentration*—JAPN 1500, 1510 or equivalents, and 1700; *Korean concentration*—KREN 1500, 1510 or equivalents, and 1700

Distribution of courses 1 survey course in Chinese, Japanese, Korean, or East Asian history and culture; 3 courses in literature in translation numbered EALL 2000–3999, one of them premodern; 3 adv courses with readings in Chinese, Japanese, or Korean

Senior requirement One-term senior essay (EALL 4910) or yearlong senior essay (EALL 4920, 4930)

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The Department of East Asian Languages and Literatures offers a Certificate of Advanced Language Study in Chinese, Korean, and Japanese. A certificate adviser, typically the director of undergraduate studies (DUS), advises students on the

certification process. The Certificate of Advanced Language Study, once certified, is listed on the student's transcript.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. (Courses conducted in English, such as CHNS 1700 and 1710, JAPN 1700 and 1710, and KREN 1700 do not count.) All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the certificate adviser, one advanced non-L5 course, conducted in the target language, such as an independent study course (graded pass/fail), a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course taught in English to count toward the certification requirements provided the course includes at a minimum a weekly discussion section conducted entirely in the target language. The discussion section must enroll a minimum of three students and the course must be designated as LxC in the course description.

The certificate adviser may also approve the substitution of up to two credits earned during study abroad and taught in the target language to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure those courses appear on their transcript.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY OF THE DEPARTMENT OF EAST ASIAN LANGUAGES AND LITERATURES

Professors Aaron Gerow (*Chair*), Tina Lu, Jing Tsu

Associate Professors Lucas Bender, Michael Hunter, Hwansoo Kim

Assistant Professors Kyunghee Eo, Rosa van Hensbergen, Yoshitaka Yamamoto

Senior Lecturer Pauline Lin

Senior Lectors II Angela Lee-Smith, Rongzhen Li, Ninghui Liang, Hiroyo Nishimura, Peisong Xu

Senior Lectors Hsiu-hsien Chan, Min Chen, Boo Kyung Jung, Fan Liu, Jianhua Shen, Wei Su, Chuanmei Sun, Haiwen Wang, Yu-lin Wang Saussy, Mika Yamaguchi, Yongtao Zhang, William Zhou

Lectors Jingjing Ao, Seunghee Back, Hye Seong Kim, Hyun Sung Lim, Saori Nozaki, Yuki Sakomura

East Asian Studies

Director of undergraduate studies: Lucas Bender (luke.bender@yale.edu); macmillan.yale.edu/eastasia

In the East Asian Studies major, students focus on a country or an area within East Asia and focus their work in the humanities or the social sciences. The major offers a liberal education that serves as excellent preparation for graduate study or for business and professional careers in which an understanding of East Asia is essential.

The major in East Asian Studies is interdisciplinary, and students typically select classes from a wide variety of disciplines. The proposed course of study must be approved by the director of undergraduate studies (DUS).

PREREQUISITE

The prerequisite to the major is completion of study at the L2 level of an East Asian language taught at Yale or the equivalent.

REQUIREMENTS OF THE MAJOR

Beyond the prerequisite, the major consists of thirteen course credits, which may include up to six taken in a preapproved program of study abroad. Six course credits must be taken in East Asian language courses, including a course at the L4 level and one year of advanced study (L5) with readings in the East Asian language.

Beyond the language requirement, the major includes seven course credits, six in the country or area of focus and one outside it. Areas of focus include: China, Korea, or Japan. Of the course credits in the area of focus, one must be in the premodern period, at least two must be seminars, and one is the senior requirement. Both seminars must be completed before the semester in which students complete their senior essay. These courses are normally taken at Yale during the academic year, but with prior approval of the DUS the requirement may be fulfilled through successful coursework undertaken elsewhere.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major, with permission of the DUS.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Before enrolling in the course in which the senior requirement will be met, students must have completed the two seminars related to their area of focus requirement. During the senior year, all students must satisfy a senior requirement consisting of a major research project that uses Chinese, Japanese, or Korean-language materials, reflects an up-to-date understanding of the region, and demonstrates a strong command of written English. This requirement can be met in one of three ways. (1) Students may take a seminar that relates to the country or area of focus, culminating in a senior thesis. Students who are unable to write a senior essay in a seminar may complete (2) a one-term senior essay in EAST 4900, or (3) a one-credit, two-term senior research project in EAST 4910, EAST 4920 culminating in an essay. The adviser

for the senior project should be a faculty member associated with the Council on East Asian Studies with a reading knowledge of the target language materials consulted for the essay.

ADVISING

Selection of courses Upon entering the major, students are expected to draw up an intellectually coherent sequence of courses in consultation with the DUS. They must consult with the DUS each term concerning their course schedules. They should identify as soon as possible a faculty adviser in their area of focus. As a multidisciplinary program, East Asian Studies draws on the resources of other departments and programs in the University. Students are encouraged to examine the offerings of other departments in both the humanities and the social sciences, as well as Residential College Seminars, for additional relevant courses. The stated area of focus of each student determines the relevance and acceptability of other courses. For a complete listing of courses approved for the major, see the Council on East Asian Studies website.

Courses in the graduate and professional schools Qualified students may elect pertinent courses in the Graduate School and in some of the professional schools with permission of the instructor, the EAST DUS, and the director of graduate studies of the relevant department or the dean or registrar of the professional school.

Combined B.A./M.A. degree program Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult the DUS prior to the fifth term of enrollment for specific requirements in East Asian Studies.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite L2 level of an East Asian lang taught at Yale or the equivalent

Number of courses 13 course credits beyond prereq (incl senior req); up to 6 may be in preapproved study abroad

Distribution of courses 6 course credits in East Asian lang courses, incl 1 L4 course and 1 year at L5 level with readings in the lang; 6 addtl course credits in country or area of focus, incl 1 in premodern era and 2 seminars (the two seminars must be completed before starting senior req); 1 course credit on East Asia outside country or focus area

Senior requirement Senior sem culminating in senior thesis, or one-term senior essay in EAST 4900, or one-credit, two-term senior research proj in EAST 4910, 4920 culminating in an essay

FACULTY ASSOCIATED WITH THE PROGRAM OF EAST ASIAN STUDIES

Professors Daniel Botsman (*History*), Fabian Drixler (*History*), Aaron Gero*w* (*East Asian Languages & Literatures; Film & Media Studies*), Valerie Hansen (*History*), Hwansoo Kim (*Religious Studies*), Tina Lu (*East Asian Languages & Literatures*), Helen Siu (*Anthropology*), Chloe Starr (*Divinity School*), Jing Tsu (*East Asian Languages & Literatures*; *Comparative Literature*), Anne Underhill (*Anthropology*), Arne Westad (*Global Affairs; History*), Mimi Yiengpruksawan (*History of Art*)

Associate Professors Lucas Bender (*East Asian Languages & Literatures),* Eric Greene (*Religious Studies*), William Honeychurch (*Anthropology*), Michael Hunter (*East Asian Languages & Literatures*), Yukiko Koga *(Anthropology)*

Assistant Professors Jinyi Chu (*Slavic Languages and Literatures*), Maura Dykstra *(History)*, Kyunghee Eo (*East Asian Languages & Literatures),* Bo kyung Blenda Im (*Sacred Music; Divinity*), Daniel Mattingly (*Political Science*), Charles McClean (*Political Science*), Quincy Ngan (*History of Art*), Marta Sanvido *(Religious Studies),* Hannah Shepherd (*History*), Rosa van Hensbergen (*East Asian Languages & Literatures*), Yoshitaka Yamamoto (*East Asian Languages & Literatures*), Emma Zang *(Sociology)*

Senior Lecturer Pauline Lin (*East Asian Languages & Literatures*)

Lecturers Usmon Boron, Ugyan Choedup, Hyemin Lee, Wonseok Lee, Sheng Long, J. Scott Lyons, Maddalena Poli, Luciana Sanga, Tulku Ngawang Sonam, Catherine Tsai, Yingxue Wang

Senior Lectors II Angela Lee-Smith, Rongzhen Li, Ninghui Liang, Hiroyo Nishimura, Peisong Xu

Senior Lectors Hsiu-hsien Chan, Min Chen, Boo Kyung Jung, Fan Liu, Jianhua Shen, Wei Su, Chuanmei Sun, Haiwen Wang, Yu-lin Wang Saussy, Mika Yamaguchi, Yongtao Zhang, William Zhou

Lectors Jingjing Ao, Seunghee Back, Hye Seong Kim, Hyun Sung Lim, Saori Nozaki, Yuki Sakomura

Ecology and Evolutionary Biology

Director of undergraduate studies: Thomas Near (thomas.near@yale.edu); eeb.yale.edu

The Department of Ecology and Evolutionary Biology (EEB) offers broad education in the biological sciences, covering subject matter that ranges from molecules, cells, and organs through organisms to communities and ecosystems, and the evolutionary processes that shape them. The department offers a B.S. and a B.A. degree. The B.S. program is designed for students planning to pursue graduate study in ecology and evolutionary biology, other biological disciplines, environmental science, or to attend medical, dental, or veterinary school. The B.A. program is intended for students who are interested in ecology, evolution, and organismal diversity as part of a liberal education but do not intend to pursue graduate work in the discipline, or for students who are interested in a second major. The two programs share the same prerequisites, introductory courses, and core requirements but differ in their electives and senior requirements.

COURSES FOR NONMAJORS

Several EEB courses have no college-level prerequisites and are suitable for nonmajors. These include all 1000-level offerings as well as 2000-level courses that deal with particular organism groups such as plants, fish, mammals, birds, and insects or other invertebrates.

CONCENTRATIONS

Students majoring in EEB select one of two concentrations. The concentration in *Biodiversity and the Environment* emphasizes courses appropriate for careers in ecology, evolutionary biology, and environmental science. The concentration in *Organismal Biology* is appropriate for premedical, predental, and preveterinary students, and for students interested in research in physiology, functional morphology, and anatomy. The EEB major offers opportunities for independent research in both laboratory and field.

PREREQUISITES

The prerequisites for the major are intended to provide core scientific literacy; they include courses in biology, chemistry, physics, and mathematics. Finishing these introductory courses early allows for a more flexible program in later years, but it is not necessary to complete them before declaring the major.

The introductory biology sequence BIOL 1010-1040 is required. Also required are a two-term lecture sequence in general chemistry, CHEM 1610, 1650, or CHEM 1630, 1670, with associated laboratories, CHEM 1340L and 1360L; one term of mathematics (MATH 1150 or 1160 or 1200) or one term of statistics & data science (S&DS 1000 or 2300).

Students should take four additional courses, for a total of four credits, from among the following options: MATH 1150 or 1160, MATH 1180 or 1200, MATH 2220 or 2250, MATH 2350, 2410, 2420, 2440, 2460, 2470, 2550, S&DS 1000, 2200, 2300, 2380, 2400, CPSC 1001, 1230, 2010, CHEM 1740 or 2200, CHEM 1750 or 2210, CHEM 2220L, 2230L, PHYS 1700 or 1800, PHYS 1710 or 1810, EPS 1100, 2120, 2200,

2220, 2320, 2400, and 2550. No more than two of these four additional courses may originate in the same department.

An online program, ONEXYS for Physics, will be offered in the summer by the Mathematics and Physics departments and by the Poorvu Center for Teaching and Learning, to review math skills needed in preparation for introductory physics courses.

Acceleration credit awarded in chemistry, mathematics, and physics, or completion of advanced courses in those departments, may be accepted in place of the corresponding introductory courses for the EEB major. Students who have mathematics preparation equivalent to MATH 1150 or higher are encouraged to take a statistics course and/or additional mathematics or statistics courses such as MATH 1200, 1210, MATH 2220 or 2250 or 2260, and S&DS 2200 or 2300. Students are strongly urged to take general chemistry in the first or second year. Students who place out of general chemistry can take organic chemistry during their first year.

PLACEMENT PROCEDURES

Students can place out of the introductory biology sequence (BIOL 1010, 1020, 1030, 1040) by means of the biology placement examination administered jointly by the biological science departments, EEB, MB&B, and MCDB, at the beginning of the first year.

Potential EEB majors are expected to take the mathematics placement test. Those who place above the level of MATH 1120 may proceed to introductory courses for the EEB major; those who place into MATH 1120 must take that course first.

For information about placement examinations, refer to the *Calendar for the Opening Days of College* and the Yale College Dean's Office website. The Chemistry department arranges placement in chemistry courses.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Ecology and Evolutionary Biology major requirements.

B.S. degree program Beyond the prerequisites, the B.S. degree requires three lecture courses and one laboratory, for three and one-half course credits; two electives for two course credits, one of which must be a lecture or a seminar; and the senior requirement. The required courses in the *Biodiversity and the Environment* concentration are EEB 2220, 2225, and a lecture course on organismal diversity usually chosen from EEB 2246–2272, along with its associated laboratory, or EEB 3326 and EEB 3327L. Other lecture courses on organismal diversity, with laboratory, are permitted with approval of the DUS, including MCDB 2900 and 2910L. Required courses in the *Organismal Biology* concentration include EEB 2290; EEB 2295 or BENG 3200; MCDB 3000 or MB&B 3000; and EEB 2291L. Most EEB, MCDB, or MB&B courses numbered 200 or above qualify as electives, as do most research courses and laboratories in a biological sciences department or in the Yale School of Medicine. Courses from other science departments as well as Mathematics, Statistics and Data Science, and Computer Science may qualify with permission of the DUS. Residential College Seminars may not be counted toward the requirements of the major.

B.A. degree program Beyond the prerequisites, the B.A. degree requires the same courses as the B.S. degree, except for the two electives for a total of three and one-half course credits (not counting the senior requirement).

Limit on research courses While independent research courses may be taken multiple times for credit, there are restrictions on the number of such courses that can be included in a student's curriculum. See Academic Regulations, section C, Course Credits and Course Loads. Interested sophomores and juniors can take EEB 4469 and EEB 4474. For information on how to become involved in research, see the EEB Guide to Research and Undergraduate Research Opportunities. For information on fellowships and summer experiences, see the EEB Guide to Fellowships and Summer Experiences.

Limit on courses taken in the professional schools Undergraduates may apply up to 4 courses taken in the professional schools for credit towards graduation. See Academic Regulations, section L, Special Academic Arrangements for more information.

Graduate courses of interest to undergraduates Graduate courses in the biological and biomedical sciences that may be of interest to undergraduates are listed in the Graduate School online bulletin, and many are posted on the Biological and Biomedical Sciences website. There is no limit on the number of courses students may take in the Graduate School of Arts and Sciences. Additional information is available from the DUS and the director of graduate studies. Undergraduates with an appropriate background may enroll with the permission of the director of graduate studies and the instructor.

Credit/D/Fail No course, including prerequisites, taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

B.S. degree program Students in the B.S. degree program fulfill the senior requirement by completing two terms of original research in EEB 4475 and EEB 4476, or in EEB 4495 and EEB 4496. Students interested in conducting research before their senior year may do so by taking EEB 4469 or EEB 4474, but they do not count toward the senior requirement.

B.A. degree program Students in the B.A. degree program fulfill the senior requirement either by completing one term of independent study in EEB 4470 or by writing a senior essay. The senior essay may be related to the subject matter of a course, but the senior essay is a separate departmental requirement in addition to any work done in a course and does not count toward the grade in any course. Students intending to write a senior essay must obtain an approval form from the office of the DUS and have it signed by the senior essay adviser before the end of the course selection period. Senior essays must be submitted to the DUS by the last day of classes.

ADVISING

First-year students considering a major in Ecology and Evolutionary Biology are invited to consult with the DUS. After the first year, students should choose an adviser from the department faculty who has interests comparable to their own and/or is a fellow of

their residential college. For additional information, visit the EEB website. Students in EEB should consult one of the advisers assigned to their class (see below). The course schedules of all EEB majors (including sophomores intending to major in EEB) must be reviewed by a faculty member in EEB; the signature of the DUS is not required, but is valid for any student. Students whose regular adviser is on leave can consult the DUS to arrange for an alternate.

PEER MENTORS

Peer mentors provide a helpful student perspective to navigating the major and the department. Students are encouraged to contact them.

YEEBUG is an undergraduate group of Yale's Ecology and Evolutionary Biology majors. The student members organize social events and panels, lead field trips, and represent the group at bazaars and academic fairs.

STUDY ABROAD

Participation in study abroad field programs is encouraged. The Organization for Tropical Studies (OTS) and the School for Field Studies (SFS) provide specific opportunities for study of tropical and conservation biology. Credit for such programs may apply toward the major; interested students should consult the DUS prior to going abroad.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites 13 courses for 11 credits, as specified

Number of courses *B.S.*—5½ course credits beyond prereqs (not incl senior req); *B.A.*—3½ course credits beyond prereqs (not incl senior req)

Specific courses required For both the *B.A.* and the *B.S.* degrees in *Biodiversity and the Environment*—EEB 2220, EEB 2225; in *Organismal Biology*—EEB 2290; EEB 2295 or BENG 3200; MCDB 3000 or MB&B 3000; and EEB 2291L

Distribution of courses For both the *B.A.* and the *B.S.* degrees in *Biodiversity and the Environment*—1 lecture course from EEB 2246–2272 with associated lab, or EEB 3326 and EEB 3327L; Additionally for the *B.S.*—2 electives as specified

Substitutions permitted MCDB lecture/lab courses on organismal diversity for EEB lecture/lab

Senior requirement *B.S.*—two terms of EEB 4475 and EEB 4476, or EEB 4495 and EEB 4496; *B.A.*—EEB 4470 or senior essay

CONCENTRATIONS

Students majoring in EEB select one of two concentrations.

The concentration in *Biodiversity and the Environment* (formerly Track 1) emphasizes courses appropriate for careers in ecology, evolutionary biology, and environmental science.

Required courses:

- EEB 2220
- EEB 2225

- a lecture course on organismal diversity usually chosen from EEB 2246–2272, along with its associated laboratory, or EEB 3326 and EEB 3327L

The concentration in *Organismal Biology* (formerly Track 2) is appropriate for premedical, predental, and preveterinary students, and for students interested in research in physiology, functional morphology, and anatomy. The EEB major offers opportunities for independent research in both laboratory and field.

Required courses:

EEB 2290

EEB 2295 or BENG 3200

MCDB 3000 or MB&B 3000

EEB 2291L

FACULTY OF THE DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY

Professors †Richard Bribiescas, †Nicholas Christakis, Michael Donoghue, Casey Dunn, Erika Edwards, †Vivian Irish, Walter Jetz, Thomas Near (*Chair*), David Post, Jeffrey Powell, Richard Prum, †Eric Sargis, †Oswald Schmitz, †David Skelly, Stephen Stearns, †Jeffrey Townsend, Paul Turner, †J. Rimas Vaišnys, Günter Wagner

Associate Professors †Craig Brodersen, †Liza Comita, †Forrest Crawford, †James Noonan, Carla Starver, †Alison Sweeney, David Vasseur

Assistant Professors Martha Munoz, Alvaro Sanchez

Senior Lecturer Marta Martínez Wells

Lecturers Adalgisa Caccone, Linda Puth

†A joint appointment with primary affiliation in another department or school.

Economics

Director of undergraduate studies: Giovanni Maggi (giovanni.maggi@yale.edu), 115 Prospect St., Rosenkranz Hall, Room 334; 432-3574; economics.yale.edu/undergraduate-program

Economics is much broader than the study of recessions and inflation or stocks and bonds. Economists study decision making and incentives, such as how taxes create incentives for labor market and savings behavior. Many current public policy debates concern questions of economics, including causes and consequences of inequality and gender and racial wage gaps; how to address poverty; the impact of immigration and trade on the well-being of a country's citizens; the cause of the Great Recession; and how to predict future downturns.

At Yale, economics is regarded and taught as part of a liberal arts education, not as a preparation for any particular vocation. It can, however, provide a good background for several professions. The economics major strengthens critical reasoning skills and gives students experience analyzing data, skills that will serve students well on the job market both inside and outside academia. Recent majors have pursued careers in business, government, and nonprofits. Others have entered law, medical, or business school, or have gone on to graduate work in economics, often after working in related fields for two or three years.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Economics major requirements.

There are no prerequisites for the major. Twelve credits are necessary to complete the major (11 Economics courses and 1 Mathematics course). The required distribution of courses is as follows:

Math requirement This can be fulfilled by MATH 1100/1110, 1120, 1150, 1160, ENAS 1510, or preferably MATH 1180 or 1200. MATH 1180 and 1200 are recommended because they emphasize economics applications. Any Math course numbered 2000 or higher can also be used to fulfill the math requirement. Note that MATH 1100 and 1110 together count as one course toward the economics major.

Introductory microeconomics ECON 1108 or ECON 1110 or ECON 1115. This requirement can be skipped or taken Cr/D/F based on pre-college testing or other circumstances, but an extra elective course is required in this case.

Introductory macroeconomics ECON 1111 or ECON 1116. This requirement can be skipped or taken Cr/D/F based on pre-college testing or other circumstances, but an extra elective course is required in this case.

Intermediate microeconomics ECON 2121 or ECON 2125

Intermediate macroeconomics ECON 2122 or ECON 2126

Econometrics ECON 1117 or ECON 2123 or ECON 2136

Four electives Any Economics course numbered 1159 or above can count as an elective, if not already applied towards the core requirements. With DUS approval, a non-Economics course that is related to economics can be used to fulfill one of the electives.

Senior requirement Two courses numbered ECON 4400–4491 (at least one taken in senior year) are required.

Senior essay Writing a senior essay is optional, but it is necessary to earn distinction in the major.

Distinction in the major To earn Distinction, a student must write a senior thesis earning a grade of A- or better and receive A- or better in three-quarters of the courses that are counted toward the major (not including introductory microeconomics, introductory macroeconomics, the math requirement or courses taken outside of Yale). Economics courses taken beyond the requirements of the major are counted toward the Distinction calculation.

Credit/D/Fail No course taken Cr/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

Note Residential College Seminars and First Year Seminars may not be counted toward the requirements of the major.

INTRODUCTORY COURSES

Many Yale students, regardless of what major they later choose, take introductory courses in economics. The department offers introductory courses in microeconomics, macroeconomics, and econometrics. Microeconomics examines how individuals, firms, markets, and governments allocate scarce resources; macroeconomics studies growth, unemployment, inflation, and international economics; econometrics teaches students statistical fundamentals and how to analyze data to answer economic questions. Students should take introductory microeconomics before taking either introductory macroeconomics or introductory econometrics.

ECON 1115 is concerned with microeconomics and includes such topics as markets, prices, production, distribution, and the allocation of resources. ECON 1116 covers such macroeconomic issues as unemployment, inflation, growth, and international economics. ECON 1117 introduces students to basic aspects of working with data to answer economic questions, as well as to the fundamentals of statistical analysis. ECON 1116 and 1117 have microeconomics as a prerequisite. ECON 1115, 1116, and 1117 are lecture courses with accompanying discussion sections.

ECON 1110 and 1111 are smaller, slightly more discussion-oriented versions of introductory microeconomics and macroeconomics. Those with little or no experience in calculus may be better served by ECON 1108, which covers microeconomics with greater discussion of quantitative methods and examples. ECON 1108, 1110, and 1115 are similar in substance; ECON 1111 and 1116 are similar in substance as well.

The department recommends that students interested in majoring in Economics take at least two introductory economics courses in the first year. To make the introductory

courses available to all first-year students and to students majoring in other subjects, the introductory courses do not have a mathematics requirement.

In the summer before they enter, all first-year students receive, through the University's electronic bulletin board, a personalized recommendation for a first course in economics, based on application data and AP (or equivalent) exam scores. In general, students who receive a score of 5 on the Microeconomics or Macroeconomics AP exam *and* a score of 5 on the AP Calculus BC exam are recommended to place out of the corresponding introductory course and instead enroll in intermediate-level courses (ECON 2121 or 2125 for microeconomics, ECON 2122 or 2126 for macroeconomics).

MATHEMATICS COURSES

Students are advised to meet the mathematics requirement for the major during their first year. To fulfill the requirement, the department recommends that majors take MATH 1180 or MATH 1200, or a higher-level course. Also acceptable, but less preferred, are MATH 1120, 1150, 1160, ENAS 1510, or MATH 1100 and 1110. Students who intend to pursue a graduate degree in economics should take additional math courses, including linear algebra (MATH 2220) or even better, a proof-based course (MATH 2250 or 2260) and a real analysis course (MATH 2550 or 2560).

ECONOMETRICS COURSES

Students are encouraged to take two econometrics courses, especially if they are interested in a research experience on or off campus. Two econometrics courses are required to write a senior essay (see below). The analysis of economic data has become central to the work of economists, and the ability to analyze large data sets is a skill that will serve students in the job market both inside and outside of academia. A natural path is for students to take ECON 1117 followed by 2123. Students with a stronger mathematics background, who prefer a more theoretical treatment of the material or who plan to pursue a graduate degree in economics, are encouraged to take ECON 2135 or S&DS 2410 and S&DS 2420, followed by ECON 2136. Prospective majors planning to take a two-term econometric sequence are urged to start the sequence by the fall of sophomore year.

Note S&DS 2410 and 2420 together count as one course toward the economics major. Further note that neither ECON 2135 nor S&DS 2410 and 2420 fulfill the major's requirement of one econometrics course as they are courses in probability and statistics that are prerequisites for ECON 2136, a course in econometrics. However, either ECON 1117 or ECON 2123 fulfills the econometrics requirement.

INTERMEDIATE MICROECONOMICS AND MACROECONOMICS COURSES

Two course options are available in both microeconomics and macroeconomics. The standard intermediate courses are ECON 2121 and 2122. Students with a stronger mathematics background who are interested in a more theoretical treatment of the material are encouraged to take ECON 2125 and 2126 instead. The intermediate courses need not be taken in sequence: in particular, ECON 2125 is not required for 2126; ECON 2121 is not required for 2122.

ELECTIVES

The department offers a wide selection of courses in a variety of fields that can be used as electives. These courses are numbered ECON 1159 and above. Some of these

courses have no prerequisites or only introductory microeconomics as a prerequisite. Others apply intermediate-level theory or econometrics to economic problems and institutions, and for this reason list one or more of the theory or econometrics courses as prerequisites. With DUS approval, a Yale non-Economics course that is related to economics can be used to fulfill one of the electives. See the Economics department website for more details.

SENIOR REQUIREMENT

Two courses numbered ECON 4400–4491 (at least one taken in senior year) are required.

Advanced lecture courses, generally numbered ECON 4440–4449, are limited-enrollment courses that cover relatively advanced material in more depth than regular field courses. While these courses vary in approach, they share features of other Economics courses: like field courses, they devote some time to traditional lecturing, and like seminars, they emphasize class interaction, the writing of papers, and the reading of journal articles. Advanced lecture courses may be applied toward the senior requirement.

Senior seminars are generally numbered ECON 4450–4490. Although there is diversity in approaches in the various seminars, all have in common an emphasis on class interaction, the writing of papers, and the reading of journal articles. Seminars represent an opportunity for students to apply and extend the economics they have learned through their earlier coursework.

Enrollment in seminars and advanced lecture courses is limited. Senior Economics majors who have not yet completed the senior requirement for the major are given priority for these courses and may enter preference selection before the registration period for these courses; see the department website for instructions. Other majors and non-majors may enroll in Economics seminars and advanced lecture courses as space permits, but they may not enter preference selection.

SENIOR ESSAY

Students have the option to write a Senior Essay; it is not required. There are three types of senior essays: (1) students may write a one-term essay in the fall of the senior year as an independent project on a topic of their own design under the close and regular supervision of a faculty adviser; (2) students may write a two-term essay in their final two terms of the senior year as an independent project on a topic of their own design under the close and regular supervision of a faculty adviser; (3) students may write a two-term essay in consecutive terms, beginning in an advanced course (numbered 4400–4490), and completed in the final term of the senior year as an independent project under supervision of a faculty adviser. Under this final option, the instructor of the advanced course taken in the fall term typically serves as the faculty adviser for the full academic year.

Students are required to complete a second semester of econometrics either before or during the first semester of senior year. Please refer to the Economics department website for information on the courses that qualify.

ADVISING

The Economics department has faculty advisers for each residential college. Students considering a major in economics as well as declared economics majors should consult with an economics adviser for their college during course enrollment. Questions concerning the major may also be directed to the department peer mentors. A list of peer mentors can be found on the department website.

Outside credit

Students who take courses outside of Yale may petition the DUS to count some of them toward the requirements of the major. Students should consult with the DUS before taking such courses. Courses taken outside of Yale may not be counted toward the major requirements in intermediate microeconomics, intermediate macroeconomics, econometrics, mathematics, or the senior requirement. There are also restrictions on the number of credits that can be transferred: see the department website section on transferring credits.

Graduate courses

Well-qualified students who have acquired the requisite background in undergraduate courses may be admitted to graduate courses and seminars. Descriptions of courses are available on the department website.

Students who are planning graduate work in economics should take additional mathematics courses beyond the one-term course required for the major. Many graduate programs in economics require courses in multivariate calculus, linear algebra, and real analysis. Please see the department website on Ph.D. program preparation. Students are urged to discuss their plans for graduate work with the DUS as early in their college careers as possible.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (including math req and senior req)

Distribution of courses Introductory micro and macro; intermediate micro (ECON 2121 or 2125); intermediate macro (ECON 2122 or 2126); econometrics (ECON 1117 or 2123 or 2136); one math course (MATH 1120 or above, see Math requirement options); four electives (see above)

Substitutions permitted 1 non-ECON course related to economics, with DUS approval, can replace an elective course. If you place out of an introductory course you must take an additional elective.

Senior requirement 2 courses numbered ECON 4400–4491 (at least one of which taken in senior year)

FACULTY OF THE DEPARTMENT OF ECONOMICS

Professors Joseph Altonji, Donald Andrews, Costas Arkolakis, Orazio Attanasio, Dirk Bergemann, Steven Berry, Xiaohong Chen, Ray Fair, John Geanakoplos, Pinelopi Goldberg, Philip Haile, Marina Halac, Gerald Jaynes, Amit Khandelwal, Yuichi Kitamura, Alvin Klevorick, Samuel Kortum, Giovanni Maggi, Konstantinos Meghir, Mushfiq Mobarak, Giuseppe Moscarini, Kaivan Munshi, Christopher Neilson, William

Nordhaus, Gerard Padró i Miquel, Rohini Pande, Benjamin Polak, Mark Rosenzweig, Larry Samuelson, Katja Seim, Anthony Smith, Philipp Strack, Aleh Tsyvinski, Edward Vytlacil, Fabrizio Zilibotti

Associate Professors Jose-Antonio Espin-Sanchez, Mira Frick, Zhen Huo, Mitsuru Igami, Ryota Iijima, Ilse Lindenlaub, Michael Peters, Nicholas Ryan

Assistant Professors Lauren Falcao Berquist, Max Cytrynbaum, Eduardo Dávila, Charles Hodgson, John Eric Humphries, Yusuke Narita, Cormac O'Dea, Winnie van Dijk

Senior Lecturers Marnix Amand, Michael Boozer, Evangelia Chalioti, William Hawkins, Tolga Koker, Guillermo Noguera, Soenje Reiche, María Saez Martí, Rebecca Toseland

Economics and Mathematics

Directors of undergraduate studies: Giovanni Maggi (giovanni.maggi@yale.edu) (Economics), 115 Prospect St., Rosenkranz Hall, Rm. 334; Sebastian Hurtado-Salazar (Mathematics); Miki Havlickova (Mathematics); Math DUS (math.dus@yale.edu)

The Economics and Mathematics major is intended for students with a strong interest in both mathematics and economics, and for students who may pursue a graduate degree in economics.

PREREQUISITES

The major has prerequisites in both mathematics and economics: MATH 1200; ECON 1110 or 1115; and ECON 1111 or 1116. Upper level economics courses may be substituted for prerequisite economics courses. With prior written permission from the Mathematics DUS, students who completed multivariable calculus during high school may substitute a higher level mathematics course in the same area. Upper-level courses substituted for prerequisites do not count toward the total of twelve term courses (beyond the introductory level in economics and mathematics) required for the major.

REQUIREMENTS OF THE MAJOR

See Links to the attribute indicating courses approved for Economic theory seminar requirements.

A total of twelve term courses is required beyond the introductory level in economics and in mathematics: seven term courses in economics numbered above 2120, and five term courses in mathematics numbered above 2250 (except MATH 4700, MATH 2410 and MATH 2420 - see below). These courses must include:

1. One intermediate microeconomics course (ECON 2125 is preferred, but ECON 2121 is also acceptable) and one intermediate macroeconomics course (ECON 2126 is preferred, but ECON 2122 is also acceptable).
2. Two mathematical economics courses, ECON 3351 or 4425 and one of ECON 3350, 4417, or 4433.
3. Two courses in econometrics, ECON 2135 (or equivalent) and ECON 2136. ECON 2135 can be replaced by S&DS 2410 and 2420, in which case they count as one economics course and not as mathematics courses. Neither S&DS 2410 nor 2420 can be counted toward the major in parallel to ECON 2135.
4. One proof-based linear algebra course (MATH 2250 or 2260) and one real analysis course (MATH 2550 or 2560).
5. A senior seminar as described in the "Senior requirement" section below. MATH 4800 or 4810 counts toward the required mathematics courses; an Economic theory seminar counts toward the required economics courses.

A course must be listed with a MATH number to count toward the mathematics requirements—substitutions from other departments are not permitted. Graduate mathematics courses level 5000-5999 may be counted as electives; graduate mathematics courses level 6000 or above may not be counted.

Distinction in the Major To be considered for Distinction in the Major, students must meet minimum grade standards, as specified under "Honors" in The Undergraduate Curriculum, and submit a senior essay in Economics that earns a grade of A or A–. For details on the senior essay in Economics see Economics. All courses beyond the introductory level in Mathematics and Economics are counted in the computation of grades for Distinction.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including the prerequisites.

Outside credit Courses taken after matriculation at Yale at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students must take either a senior seminar in mathematics, MATH 4800 or 4810, or an Economic theory seminar, designated as YC ECON Theory Seminar in Yale Course Search. A senior essay in Economics is optional.

ADVISING

Students interested in the major should consult both DUSs, and verify with each that their proposed program meets the relevant guidelines.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites MATH 1200; ECON 1110 or 1115; ECON 1111 or 1116

Number of courses 12 term courses beyond prerequisites (incl senior req)

Distribution of courses 7 economic courses above 2120 and 5 math courses above 2250 (excluding MATH 4700, 2410, and 2420)

Specific courses required ECON 2125 or 2121; ECON 2126 or 2122; ECON 2135; ECON 2136; ECON 3350 or 4417 or 4433; ECON 3351 or 4425; MATH 2250 or MATH 2260; MATH 2550 or MATH 2560, as specified

Substitution permitted S&DS 2410 and 2420 for ECON 2135, with permission of Economics DUS

Senior requirement Senior sem in math (MATH 4800 or MATH 4810) or an Economics theory seminar

Education Studies Certificates

Associate director: Lauren Carpenter (lauren.carpenter@yale.edu), **Faculty director**: Maria Pinango; https://educationstudies.yale.edu/, Program FAQ

The Education Studies Program in Yale College provides a structured pathway for students interested in education theory and research, policy, and pedagogy. Through the study of education, students engage in an interdisciplinary exploration of a fundamental institution that shapes citizenship, governance, social reproduction, child development, and social inequality. Yale courses across the disciplines address these varying aspects of education through three area categories: (1) theory and research, (2) policy, and (3) pedagogy.

Students can engage with Education Studies through one of *two pathways* alongside their major:

- The Scholar Intensive Certificate, which offers a cohort-learning experience and requires the completion of a capstone project.
- The Education Studies Certificate, which offers an individualized pathway that allows students to develop expertise through Education Studies coursework.

Students may opt for either the Scholar Intensive Certificate or the Education Studies Certificate.

- To apply for the Scholar Intensive Certificate, visit the Education Studies website.
- To pursue the Education Studies Certificate, register on Yale Hub.

No more than two course credits fulfilling the requirements of either Education Studies certificate may overlap with a major, a simultaneous degree, or another certificate. Additionally, no course credit may be counted toward more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major.

Any Yale College student interested in education studies may enroll in the introductory survey course, EDST 1110, Foundations in Education Studies. This lecture course explores the historical, social, philosophical, and theoretical foundations of education, providing students with a deeper understanding of its critical role in society across theory and research, policy, and pedagogy.

SCHOLAR INTENSIVE CERTIFICATE IN EDUCATION STUDIES

The Education Studies Scholar Intensive Certificate in Yale College provides a structured pathway for students interested in completing an Education Studies capstone project while learning alongside a supportive cohort from sophomore through senior year.

In the fall of their sophomore year, students who have successfully completed or are currently enrolled in EDST 1110 may apply to the Scholar Intensive Certificate alongside their major. Selected students join a close-knit cohort, engaging in small seminars and exploring through collaborative learning. With guidance from faculty, peers, and alumni, they pursue educational opportunities tailored to their

individual interests. Scholar Intensive Certificate students gain practical field experience through an academic-year or summer field placement.

REQUIREMENTS

See Links to the attributes indicating courses approved for the Theory and Research, Policy, and Pedagogy requirements.

To complete the Scholar Intensive Certificate program, students must take five courses including EDST 1110 and EDST 1261 to fulfill the Theory and Research requirement; one course in Policy or Pedagogy, two capstone courses including EDST 4400 and either EDST 4410 or 4490. Alternately, students may complete the capstone in one term with EDST 4400 and take an additional EDST elective. Students must also fulfill a field experience. Two of the five courses may overlap with the student's major. No more than two course credits may overlap in the fulfillment of the requirements of the Scholar Intensive Certificate or of a major, a simultaneous degree, or another certificate. No course credit may be counted toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major. Graduate and professional school courses may count, with approval from the Education Studies Associate Director. For a listing of courses in the area categories, see the Education Studies website.

Credit/D/Fail No more than one course in the Policy or Pedagogy curricular grouping taken Credit/D/Fail may count toward the certificate requirements.

Successful completion of the Scholar Intensive Certificate will be noted on transcripts.

SUMMARY OF REQUIREMENTS

Prerequisite EDST 1110

Number of courses 5 courses (including the prereq and senior req)

Distribution of courses 1 course credit in (1) Theory and Research (EDST 1261); 1 course credit in either (2) Policy or (3) Pedagogy

Other requirement Field experience as described on the EDST website

Senior requirement EDST 4400 or in combination with either EDST 4410 or 4490. Students completing the capstone in one term must complete an additional EDST elective.

CERTIFICATE IN EDUCATION STUDIES

See Links to the attributes indicating courses approved for the certificate requirements.

Open to all interested Yale students, the Certificate in Education Studies provides an opportunity to pursue an interdisciplinary study of education to complement their major.

To earn the certificate, students must complete a total of five courses: the prerequisite EDST 1110, one course in Theory and Research, one course in either Policy or Pedagogy, and two electives. No more than two course credits may overlap in the fulfillment of the requirements of the Education Studies Certificate or of a major, a simultaneous degree, or another certificate. Additionally, no course credit may be counted toward the requirements of more than two curricular programs. For example,

the same course credit may not be used to fulfill the requirements of two certificates and a major. Graduate and professional school courses may count with approval from the Education Studies Associate Director. For a listing of courses in the area categories, see the Education Studies website.

Credit/D/Fail With the exception of EDST 1110, no more than one course taken Credit/D/Fail may be applied toward the requirements of the certificate.

Successful completion of the Certificate will be noted on transcripts.

DECLARATION OF CANDIDACY

Once students are enrolled in the prerequisite EDST 1110, they may declare their intent to earn a Certificate in Education Studies. Students must declare their intention to earn a certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Prerequisite EDST 1110

Number of courses 5 courses

Distribution of courses 1 course credit in (1) Theory and Research, 1 course credit in either (2) Policy or (3) Pedagogy; 2 EDST electives

Electrical Engineering

Director of undergraduate studies: Fengnian Xia (fengnian.xia@yale.edu); seas.yale.edu/departments/electrical-engineering

The Electrical Engineering (EE) program at Yale College is designed to equip students with the skills and knowledge needed to thrive in today's rapidly evolving technological landscape. Our undergraduate program broadly encompasses disciplines such as microelectronics, photonics, energy, semiconductor technology, computer engineering, signal and information processing, decision and control systems, and communications. Students engage in hands-on projects and experimental design, honing their ability to analyze complex problems and communicate their findings effectively. Whether pursuing careers in government, industry, or academia, graduates of our program are prepared to make significant contributions to society and address pressing global challenges.

Three electrical engineering degree programs are offered, as well as a joint degree between the electrical engineering and computer science departments.

1. The **B.S. in Electrical Engineering**, accredited by the Engineering Accreditation Commission of ABET, Inc., is the flagship degree program and is the most challenging program in electrical engineering. This program is appropriate for highly motivated students who are interested in entering the engineering profession, and who wish for a flexible enough program to consider a variety of other career paths.

Upon graduation, Yale's B.S. Electrical Engineering (ABET) students are expected to achieve "student outcomes" as defined by ABET and the program. The Electrical Engineering major produces graduates who demonstrate: (1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics; (2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors; (3) an ability to communicate effectively with a range of audiences; (4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts; (5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives; (6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; (7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

2. The **B.S. in Engineering Sciences (Electrical)** provides similar technical exposure and equivalent rigor as the ABET program, while retaining the flexibility for students to take a broader range of courses than those mandated by the ABET curriculum. The B.S. in Engineering Sciences (Electrical) is suitable for careers in technology and is a popular choice for those choosing academic, industrial, or entrepreneurial career paths.

3. The **B.A. in Engineering Sciences (Electrical)** is suitable for careers outside of technology, including managerial, financial, and entrepreneurial career options.

4. The fourth program is a joint **B.S. in** Electrical Engineering and Computer Science, which offers a unique blend of electrical engineering and computer science courses that retains the rigor of both fields. This degree is a popular choice for those interested in information technology careers.

The program's educational objectives prepare students for four potential paths. An academic path qualifies graduates to enter a top-tier graduate program conducting research with broad applications or significant consequences, and eventually to teach at an academic or research institution. Graduates following an industrial path can enter a technical path or a managerial path. An entrepreneurial path allows graduates to bring broad knowledge to a startup company, which can deliver a product or service that meets societal needs. Graduates who elect a nontraditional engineering path might complete a professional program in business, law, or medicine, for which their engineering knowledge will be valuable.

PREREQUISITES

All three engineering degree programs require MATH 1120 and MATH 1150 if applicable, ENAS 1510 or MATH 1200 or higher, ENAS 1300 (CPSC 1001 does not fulfill this requirement), and PHYS 1800, 1810 or higher (PHYS 1700, 1710 is acceptable for the B.A. degree). Acceleration credits awarded on entrance can be used to satisfy the MATH 1120 and 1150 requirements. Students whose preparation exceeds the level of ENAS 1510 or MATH 1200 are asked to take a higher-level mathematics course instead, such as MATH 2220, MATH 2250, MATH 2260, MATH 2550, or MATH 2560. Similarly, students whose preparation at entrance exceeds the level of PHYS 1800, 1810 are asked to take higher-level physics courses instead, such as PHYS 2000, 2010. Students whose programming skills exceed the level of ENAS 1300 are asked to take a more advanced programming course instead, such as CPSC 2010; consult with the director of undergraduate studies (DUS).

Prerequisites taken Credit/D/Fail may not be counted toward the requirements of the major.

REQUIREMENTS OF THE MAJOR

Because the introductory courses are common to all three degree programs, students do not usually need to make a final degree choice before the junior year. Each student's program must be approved by the DUS.

B.S. degree program in Electrical Engineering The ABET-accredited B.S. in Electrical Engineering requires, beyond the prerequisites, four term courses in mathematics and science and thirteen term courses covering topics in engineering. These courses include:

1. Mathematics and basic science (four term courses): ENAS 1940; MATH 2220 or MATH 2250 or MATH 2260; APHY 3220 or equivalent; S&DS 2380, or S&DS 2410, or equivalent.
2. Electrical engineering and related subjects (thirteen term courses): ECE 2000, 2011, 2020, 2031, 3101, 3200, 3250, 3481, and 4811 (the ABET design project senior requirement); and four engineering electives, at least three of which should be at the 4000 level. CPSC 3650 or CPSC 3660, MENG 3020L, MENG 4050, MENG 4673, BENG 4611, PHYS 4300, APHY 4580, and all 4000-level computer science courses qualify as ABET electives. One

of ECE 4680 or ECE 4691, Advanced Special Projects, also qualify as a 4000-level elective.

The introductory engineering courses are designed such that they may be taken concurrently in the sophomore year; for example, in the fall term students may take ECE 2000 and ECE 2020, followed by ECE 2011 and ECE 2031 in the spring term. These courses may be taken in any order, with the exception of ECE 2031, which requires ECE 2000 as a prerequisite. In this case, it would be helpful to take ENAS 1940 and/or ENAS 1300 in the first year.

A sample ABET-accredited B.S. degree schedule for students who have taken the equivalent of one year of calculus in high school (and thus are not required to take MATH 1120 and MATH 1150) could include:

First Year: ECE 2000, ECE 2011, ENAS 1510, PHYS 1800, and PHYS 1810
Sophomore: ECE 2020, ECE 2031, ENAS 1300, ENAS 1940, and MATH 2220
Junior: ECE 3101, ECE 3200, ECE 3250, ECE 3481, S&DS 2380, and 1 elective
Senior: APHY 3220, ECE 4811, and 3 electives

A sample schedule for students who enter into the ABET-accredited B.S. major at the sophomore year could include:

First Year: ENAS 1510, ENAS 1300, ENAS 1940, PHYS 1800, and PHYS 1810
Sophomore: ECE 2000, ECE 2011, ECE 2020, ECE 2031, and MATH 2220
Junior: ECE 3101, ECE 3200, ECE 3250, ECE 3481, S&DS 2380, and 1 elective
Senior: APHY 3220, ECE 4811, and 3 electives

A sample schedule for students who enter into the ABET-accredited B.S. major in the first year (and are required to take MATH 1120 and MATH 1150) and only seek to fulfill basic distribution requirements with no engineering courses, could be:

First Year: MATH 1120, MATH 1150, PHYS 1800, PHYS 1810, and ENAS 1300
Sophomore: ENAS 1510, ECE 2000, ECE 2011, ECE 2020, ECE 2031, and MATH 2220
Junior: ENAS 1940, ECE 3101, ECE 3200, ECE 3250, ECE 3481, and S&DS 2380
Senior: APHY 3220, ECE 4811, and 4 electives

B.S. degree program in Engineering Sciences (Electrical) This program requires fewer technical courses and allows more freedom for work in technical areas outside the traditional electrical engineering disciplines (e.g., biomedical engineering, mechanical engineering, physics, etc.). It requires thirteen technical term courses beyond the prerequisites, specifically: MATH 2220 or MATH 2250 or MATH 2260; ENAS 1940; ECE 2000, 2011, 2020, 2031; ECE 4710 and/or 4721 (the senior requirement), or with permission of the instructor and the DUS, ECE 4811; and five or six electives (depending on senior requirement) approved by the DUS, at least three of which must be at the 4000 level. All electives listed for the ABET-accredited B.S. major qualify as electives for this degree.

For students who have taken the equivalent of one year of calculus in high school (and thus are not required to take MATH 1120 and MATH 1150), a sample schedule for the B.S. degree in Engineering Science (Electrical) could be:

First Year: ECE 2000, ECE 2000, ENAS 1510, PHYS 1800, and PHYS 1810
Sophomore: ECE 2020, ECE 2031, ENAS 1300, ENAS 1940, and MATH 2220

Junior: 3 electives
Senior: ECE 4710 and/or 4721, and two or three electives depending on the senior project

The B.S. degree in Engineering Sciences (Electrical) requires fewer specific courses and 4 fewer courses overall than the ABET-accredited degree. Any of the courses required for the ABET-accredited major qualify as electives for this degree, as well as other courses with substantial electrical engineering context, subject to the approval of the DUS. For students entering the major during the sophomore year, or those who need introductory calculus in their first year, sample schedules are similar to those described for the ABET-accredited degree program, with the differences in the B.S. Engineering Sciences (Electrical) degree applied.

The flexibility during the junior and senior years in the schedule above is often used to accommodate a second major, such as Economics, Applied Physics, Computer Science, Physics, or Mechanical Engineering.

B.A. degree program in Engineering Sciences (Electrical) This program is appropriate for those planning a career in fields such as business, law, or medicine where scientific and technical knowledge is likely to be useful. It requires eight technical term courses beyond the prerequisites, specifically: MATH 2220, MATH 2250, MATH 2260 or ENAS 1940; ECE 2000, 2011, 2020, and 4710 and/or 4721 (the senior requirement); and two (or three) approved electives.

Credit/D/Fail No courses, including prerequisites, taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

A research or design project carried out in the senior year is required in all three programs and must be approved by the DUS. Students take ECE 4710 and/or 4721, or ECE 4811, present a written report, and make an oral presentation. ECE 4811 is required for students earning the B.S. degree in Electrical Engineering (ABET). Students taking both ECE 4710 and 4721, Senior Advanced Special Projects, may count one as an elective. Arrangements to undertake a project in fulfillment of the senior requirement must be made by the end of the course selection period in the term in which the student will enroll in the course; by this date, a prospectus approved by the intended faculty adviser must be submitted to the DUS.

ADVISING AND APPROVAL OF PROGRAMS

All Electrical Engineering and Engineering Sciences majors must have their programs approved by the DUS. Arrangements to take ECE 4710, 4721, or ECE 4811 are strongly suggested to be made during the term preceding enrollment in the course. Independent research courses (ECE 4680 or ECE 4691) are graded on a Pass/Fail basis, and one (1) can be counted toward the requirements of the major.

SUMMARY OF MAJOR REQUIREMENTS

ELECTRICAL ENGINEERING, B.S.

Prerequisites MATH 1120, 1150 if needed; ENAS 1510 or MATH 1200 or higher; ENAS 1300 or higher; PHYS 1800, 1810 or higher

Number of courses 17 term courses beyond prereqs, incl senior req

Specific courses required ENAS 1940; MATH 2220 or MATH 2250 or MATH 2260; APHY 3220; S&DS 2380 or S&DS 2410; ECE 2000, 2011, 2020, 2031, 3101, 3200, 3250, 3481

Distribution of courses 4 engineering electives, 3 at 4000 level

Senior requirement One-term design project (ECE 4811) with DUS approval

ENGINEERING SCIENCES (ELECTRICAL), B.S. AND B.A.

Prerequisites *Both degrees*—MATH 1120, 1150; ENAS 1510 or MATH 1200 or higher; ENAS 1300 or higher; *B.S.*—PHYS 1800, 1810 or higher; *B.A.*—PHYS 1700, 1710 or higher

Number of courses *B.S.*—13 term courses beyond prereqs, incl senior req; *B.A.*—8 term courses beyond prereqs, incl senior req

Specific courses required *B.S.*—ENAS 1940; MATH 2220 or MATH 2250 or MATH 2260; ECE 2000, 2011, 2020, 2031; *B.A.*—1 from ENAS 1940, MATH 2220, MATH 2250, or MATH 2260; ECE 2000, 2011, 2020

Distribution of courses *B.S.*—5 or 6 electives, depending on senior req, approved by DUS, 3 at 4000 level; *B.A.*—2 or 3 electives, depending on senior req, approved by DUS

Senior requirement *B.S.*—one or two-term research or design project, ECE 4710 and/or 4721, or ECE 4811, approved by DUS; *B.A.*—one or two-term research or design project, ECE 4710 and/or 4721, approved by DUS

FACULTY OF THE DEPARTMENT OF ELECTRICAL ENGINEERING

Professors †Hui Cao, †James Duncan, Jung Han, Roman Kuc, Rajit Manohar, A. Stephen Morse, Kumpati Narendra, †Daniel Prober, Peter Schultheiss (*Emeritus*), †Lawrence Staib, †Hemant Tagare, Hongxing Tang, Leandros Tassiulas, J. Rimas Vaišnys, †Y. Richard Yang

Associate Professors Richard Lethin (*Adjunct, Lecturer*), Jakub Szefer, †Sekhar Tatikonda, Fengnian Xia

Assistant Professors Wenjun Hu, Amin Karbasi, Priyadarshini Panda

†A joint appointment with primary affiliation in another department.

Electrical Engineering and Computer Science

Directors of undergraduate studies: Rajit Manohar (rajit.manohar@yale.edu) (Electrical Engineering), 523 BCT, 432-4306; Theodore Kim (theodore.kim@yale.edu) (Computer Science), AKW 208A, 432-6400

Electrical Engineering and Computer Science is an interdepartmental major designed for students who want to integrate work in these two fields. It covers discrete and continuous mathematics, algorithm analysis and design, digital and analog circuits, signals and systems, systems programming, and computer engineering. It provides coherence in its core program, but allows flexibility to pursue technical electives.

PREREQUISITES

The prerequisites for the major are MATH 1120, 1150 (these prerequisites may be waived for students who have taken the equivalent of one year of calculus in high school) and ENAS 1510 or MATH 1200 (or a higher-level course); CPSC 1001 (for students without previous programming experience); and PHYS 1800 and 1810, or PHYS 2000 and 2010. PHYS 1700, 1710 are acceptable for students taking MATH 1120. Acceleration credits may not be used to satisfy prerequisites, and because the B.S. programs in Electrical Engineering and in Engineering Sciences (Electrical) both limit the use of such credits, students who wish to retain the option of switching to these programs should consult the director of undergraduate studies (DUS) in Electrical Engineering when planning their course schedules.

REQUIREMENTS OF THE MAJOR

The major requires fifteen term courses beyond the prerequisites: CPSC 2010; 2020; 2230; 3230; and either CPSC 3650 or 3660; ECE 2000, ECE 2011, ECE 2020, and ECE 2031; one from MATH 2220, 2250, 2260, S&DS 2380, or S&DS 2410; four advanced electives, two in electrical engineering, two in computer science; and a senior project. MATH 2440 may be substituted for CPSC 2020. Electives must be 3000- or 4000-level courses in the departments of Electrical Engineering or Computer Science or must be approved by the DUSs of both departments. Cross-titled courses may be counted either way to fulfill this requirement. CPSC 2900 and 4900 may not be used as electives. Only one of CPSC 3650 and 3660 may be taken for major credit. With permission of the DUSs of both departments, one of ECE 4680 or ECE 4691 may be used as an electrical engineering elective.

For students who have taken the equivalent of one year of calculus in high school and have some programming experience, a typical program would be:

First-Year	**Sophomore**	**Junior**	**Senior**
ECE 2000	CPSC 2010	CPSC 2020	Senior project
ENAS 1510	ECE 2020	CPSC 3230	One elective
PHYS 1800			
ECE 2011	CPSC 2230	CPSC 3650 or 3660	Two electives
PHYS 1810	ECE 2031	One elective	
	MATH 2220		

Students with no programming experience should take CPSC 1001 in the fall of their first year and either postpone ECE 2000 until their sophomore year or take ENAS 1510 or MATH 1200 in the spring.

For students with one term of calculus and no programming experience, a typical program would be:

First-Year	**Sophomore**	**Junior**	**Senior**
CPSC 1001	CPSC 2010	CPSC 2020	Two electives
MATH 1150	ECE 2000	CPSC 3230	
PHYS 1800	ECE 2020	S&DS 2410	
ECE 2011	CPSC 2230	CPSC 3650 or 3660	Senior project
MATH 1200	ECE 2031	One elective	One elective
PHYS 1810			

For students with no calculus and no programming experience, a typical program would be:

First-Year	**Sophomore**	**Junior**	**Senior**
CPSC 1001	CPSC 2010	CPSC 2020	Two electives
MATH 1120	ECE 2000	CPSC 3230	
PHYS 1700	ENAS 1510	ECE 2020	
ECE 2011	CPSC 2230	CPSC 3650 or 3660	Senior project
MATH 1150	MATH 2220	ECE 2031	One elective
PHYS 1710		One elective	

Students who start with MATH 1120 may satisfy the physics prerequisite by taking PHYS 1700 and 1710 in their first year, as shown in the table above. However, because the B.S. programs in Electrical Engineering and in Engineering Sciences (Electrical) do not allow this substitution, students who wish to retain the option of switching to these programs should postpone physics until their sophomore year.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The senior project must be completed in CPSC 4900 or ECE 4710 and/or ECE 4721, depending on the adviser's department, and must be approved by the DUS in each department.

ADVISING AND APPROVAL OF PROGRAMS

The entire program of a student majoring in Electrical Engineering and Computer Science must be approved by the DUS in each department.

Accreditation Students interested in pursuing an ABET-accredited degree should consider the B.S. program in Electrical Engineering. See Electrical Engineering.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites MATH 1120, 1150, and ENAS 1510 or MATH 1200; CPSC 1001 (students without previous programming experience); PHYS 1800, 1810, or PHYS 2000, 2010 with exceptions as indicated

Number of courses 15 term courses beyond prerequisites (including senior project)

Specific courses required CPSC 2010, 2020, 2230, 3230, and one of CPSC 3650 or 3660; ECE 2000, ECE 2011, ECE 2020, and ECE 2031; one from MATH 2220, 2250, 2260, S&DS 2380 or 2410

Distribution of courses 4 additional 3000- or 4000-level electives, 2 in electrical engineering, 2 in computer science

Substitution permitted MATH 2440 for CPSC 2020; advanced courses in other depts, with permission of DUS in each department

Senior requirement Independent project (CPSC 4900 or ECE 4710 and/or ECE 4721) approved by DUS in each department

Energy Studies Certificate

Certificate director: Michael Oristaglio (michael.oristaglio@yale.edu); earth.yale.edu/energy-studies

The Interdisciplinary Certificate in Energy Studies is designed to provide undergraduates with the knowledge and skills needed for advanced studies, leadership, and success in energy-related fields through a curriculum requiring coursework in three multidisciplinary tracks: Energy Science & Technology, Energy & Environment, Energy & Society. Activities such as field trips, funded on-campus projects, and internships will be available to students interested in hands-on experience and training in the modern world of energy technology, finance, regulation, and policy. More information about the special activities is listed on the Energy Studies website.

REQUIREMENTS

See Links to the attributes indicating courses approved for certificate requirements.

Students are required to complete two course credits in each of the three tracks of Energy Studies: (1) Energy Science & Technology, (2) Energy & Environment, (3) Energy & Society.

ENRG 3000, which is required as one of the six course credits (exceptions can be granted by the certificate director) and counts toward the Energy & Society track should be taken during the junior or senior year. ENRG 4000, the Senior Capstone Seminar, is not required but is offered to students wishing to undertake a special energy-related project. ENRG 4000 can count toward the six required course credits in any one of the three tracks, depending on the project's topic.

Approved courses are listed on the Energy Studies website and are searchable in Yale Course Search. Graduate and professional school courses and non-Yale courses accepted for full course credit by Yale College may count toward the certificate; language courses may not count toward the certificate. Students are invited to present syllabi to the certificate director for courses that they think might be suitable for fulfilling the requirements of the certificate. It is the discretion of the certificate director to approve all courses that meet the curated curriculum of the certificate.

No more than two course credits fulfilling the requirements of the Energy Studies Certificate may overlap with a major, a simultaneous degree, or another certificate. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major.

Credit/D/Fail No more than one course taken Credit/D/Fail or one independent study course graded Pass/Fail may be counted toward the requirements of the certificate.

DECLARATION OF CANDIDACY

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Prerequisites None

Number of courses 6 course credits

Required course ENRG 3000

Distribution of courses 2 courses in each of the three tracks of Energy Studies listed above

Engineering

Dean of the School of Engineering & Applied Science: Jeffrey F. Brock
engineering@yale.edu; seas.yale.edu

Programs are offered in the departments of Applied Physics, Biomedical Engineering, Chemical and Environmental Engineering, Computer Science, Electrical Engineering, and Mechanical Engineering & Materials Science. These departments are administered by the Dean of the School of Engineering & Applied Science. The School also offers interdisciplinary courses bearing on engineering programs.

Curricula in Yale's undergraduate engineering and applied science programs range from technically intensive ones to those with lesser technical content allows students considerable freedom to include courses of a nontechnical nature in their studies. Programs accredited by the Engineering Accreditation Commission of ABET, Inc., the accreditor for university programs in engineering, are the most intensive. ABET-accredited programs include B.S. degrees in Chemical Engineering, Electrical Engineering, and Mechanical Engineering.

Some students find that less intensive programs better meet their needs when considering two majors and/or careers in fields requiring less comprehensive technical knowledge. Such non-ABET programs include the B.S. in Applied Physics, Biomedical Engineering, Computer Science, or Environmental Engineering and the B.S. in Engineering Sciences—Chemical, Electrical, or Mechanical—as well as the B.A. in Computer Science or in Engineering Sciences—Electrical, Environmental, or Mechanical—designed for students planning careers in business, law, medicine, journalism, or politics who want their liberal arts education to include study of the impact that science and technology have on society. A related major in Applied Mathematics is also available.

For engineering courses and descriptions of the major programs mentioned above, see Applied & Computational Mathematics, Applied Physics, Biomedical Engineering, Chemical & Environmental Engineering, Computer Science, Electrical & Computing Engineering, Materials Science, and Mechanical Engineering.

Engineering and Applied Science

Director of undergraduate studies: Vincent Wilczynski
(vincent.wilczynski@yale.edu), 107 BCT, 436-5971

Courses in Engineering and Applied Science fall into three categories: those intended primarily for students majoring in one of the several engineering and applied science disciplines; those designed for students majoring in subjects other than engineering, the applied sciences, and the natural sciences; and those designed to meet common interests of students majoring in engineering, the applied sciences, or the natural sciences.

In the first category, the departments of Applied Physics, Biomedical Engineering, Chemical and Environmental Engineering, Computer Science, Electrical Engineering, and Mechanical Engineering and Materials Science offer courses intended primarily for majors in engineering and applied science disciplines. Courses in these departments may also be relevant for students with appropriate backgrounds who are majoring in Chemistry, Physics, Biology, Earth and Planetary Studies, and Mathematics. For information about majors in engineering and their related courses, see Applied Physics, Biomedical Engineering, Chemical Engineering, Computer Science, Electrical Engineering, Environmental Engineering, and Mechanical Engineering.

The School of Engineering and Applied Science is responsible for courses in the other two categories: technology for students majoring in subjects other than engineering, the applied sciences, and the natural sciences; and topics common to students majoring in engineering, the applied sciences, and the natural sciences. Courses for nonscience majors are intended for all students seeking a broad perspective on issues of scientific and technological import, and they introduce students who may be planning careers in law, business, or public service to concepts and methods of engineering and applied science. Courses for science and engineering majors include topics in applied mathematics and computation.

English Language and Literature

Director of undergraduate studies: Stefanie Markovits (stefanie.markovits@yale.edu); associate director of undergraduate studies: Marcel Elias (marcel.elias@yale.edu); registrar: Erica Sayers (erica.sayers@yale.edu); assistant registrar: Jane Bordiere (jane.bordiere@yale.edu); english.yale.edu/welcome-english-major

The undergraduate program in English cultivates students' powers of argument and analysis while developing their understanding of important works of English, American, and world literatures in English. Courses offered by the department are designed to teach students foundational research and writing skills; to provide historical perspectives from which to read and analyze literary works; and to deepen students' insight into their own experience. For students interested in creative writing, the department offers an array of courses taught by renowned professional writers in all of the major genres, including fiction, poetry, play and film writing, nonfiction prose, and journalism.

The ability to write well remains a rare but prized skill in almost every domain of our world, and English majors go on to careers in many fields of endeavor. The analytic talents and the writing and speaking skills honed in the major can lead graduates to careers in fields such as advocacy, publishing, teaching, the arts, law, venture capital, medicine, and policy making.

COURSES FOR NONMAJORS AND MAJORS

All English courses are open to both majors and nonmajors, although advanced seminars are intended primarily for junior and senior majors.

Introductory courses English courses numbered from ENGL 1014–1030 are introductory and are open to all students in Yale College. Students interested in the English Major or in related majors in the Humanities should consider starting in the 1020-1030 range of courses. New students planning to elect a section of ENGL 1014 or ENGL 1015 in the fall term should refer to the department website for information about preregistration. Once registered, students must attend the first and all subsequent course meetings for that particular section until the end of the add/drop period in order to retain a place. Students who miss a class meeting during this period without informing the instructor beforehand may have their places filled from the waiting list.

Advanced courses Advanced courses are open to upper-level students; the faculty recommends that students both within and outside the major prepare for such work with two terms of introductory English. Sophomores and juniors are encouraged to enroll in lecture courses in order to gain broad perspectives in preparation for more focused study. Seminars offer more intensive treatment of their topics, which are also often more specialized. While both lectures and seminars are frequently offered more than once, students should not expect the same courses to be offered from one year to the next.

Writing courses Besides courses that concentrate on the writing of expository prose (ENGL 1014, 1015, 1020, and 1021), the English department offers a number of creative writing courses. The introductory creative writing course, ENGL 1023, is open to any student who has not taken an intermediate or advanced course in the writing of

fiction, poetry, or drama. Interested students need not submit a writing sample to gain admission to ENGL 1023. Many of the more advanced creative writing courses require an application in advance, with admission based on the instructor's judgment of the student's work. Application details and forms for these courses are available on the department website. Students with questions about this process should consult the department registrar. Students may in some cases arrange a tutorial in writing (ENGL 3400), normally after having taken intermediate and advanced writing courses. All students interested in creative writing courses should also consult the current listing of Residential College Seminars.

FOUNDATIONAL COURSES

It is valuable for students majoring in English to have both a detailed understanding of major poets who have written in English and some acquaintance with the classics of American and world anglophone literature. All majors are accordingly required to take three of the four foundational courses from ENGL 1025, 1026, 1027, 1028. Prospective English majors are strongly encouraged to complete these requirements by the end of the sophomore year. Those who did not enroll in the Directed Studies program should also consider taking both ENGL 1029 and 1030, foundational courses in the European literary tradition.

Students may substitute for one foundational course either (1) DRST 0001 and 0002, or (2) ENGL 1029 and 1030. If, due to a late change of major or other circumstances, it is impossible to take three foundational courses, students may satisfy the requirements of the major by taking, with permission of the DUS, two advanced courses that deal substantially and intensively with similar material. Note: while DRST 0001 and DRST 0002 count together as one foundational course, they count as two courses toward the major.

REQUIREMENTS OF THE MAJOR

See Links to attributes indicating courses approved for the English major requirements.

At least fourteen courses are required for the major, including the senior requirement. Each student, in consultation with a departmental faculty adviser, bears the responsibility for designing a coherent program, which must include the following elements:

Each student must take: (1) three foundational courses chosen from ENGL 1025, 1026, 1027, and 1028 (see exceptions above); (2) at least one course in each of the following four historical periods, as indicated in the course listings: Medieval, Renaissance, 18th/19th century, 20th/21st century; (3) at least one literature (non-creative writing) seminar in both the junior and the senior years.

A student whose program meets these requirements may, with permission of the DUS, count as electives toward the major as many as two courses in other departments. One of these courses should normally be a literature course in English translation or in another language, and neither may be counted toward any requirement of the major. Certain Residential College Seminars, with permission of the DUS, may also be substituted for electives in the major.

A student may count up to five introductory courses and up to two designated creative writing courses toward the English major. ENGL 1023 counts towards the introductory rather than towards the creative writing limit.

Library requirement Each English major must meet with Yale's Librarian for Literature in English or another research librarian within the first four weeks of the term during which the student is fulfilling the first of the two-term senior requirement for the major. Workshops will be offered to fulfill this requirement.

Credit/D/Fail No more than 4 course(s) taken Credit/D/Fail may be applied toward the requirements of the major, but they may affect whether Distinction in the Major is granted.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

THE CREATIVE WRITING CONCENTRATION

The creative writing concentration is an intensive track for English majors who want more sustained work in creative writing. While there are many ways to pursue creative writing at Yale and within the English department, the creative writing concentration provides a structure for creative work and a community of support that many writers find rewarding. The creative writing concentration is not a separate degree or certificate; it is a part of the English major and builds on the wealth of its literary offerings. It aims to give English majors with demonstrated interest and achievement in writing an opportunity to plan the writing courses they take in a coordinated way and to do advanced work in tutorial. The creative writing concentration accepts students with demonstrated commitment to creative writing at the end of the junior year or, occasionally, in the first term of senior year.

Students who enter the creative writing concentration must fulfill the same requirements as all English majors, except that they count four creative writing courses toward the major, including ENGL 4400, a tutorial in which students produce a single sustained piece of writing or a portfolio of shorter works. It is expected that senior applicants will have completed by the end of the fall term the following: (1) at least two 4000-level designated creative writing courses that require an application with a writing sample (previously, numbered 451 or higher), with at least one of these courses in the genre in which they plan to complete ENGL 4400 (i.e., poetry, fiction, nonfiction, or drama) and (2) one designated creative writing course in another genre. Creative writing concentrators must complete at least eleven literature courses in addition to their creative writing courses, for a total of fifteen courses. All courses numbered 1030 or below count as literature courses. Residential College Seminars are not acceptable for credit toward the creative writing concentration, except by permission of the DUS. The creative writing concentration senior project may be offered in partial fulfillment of the senior requirement. Concentrators should fulfill the senior library requirement in the term in which they do the literature component of their senior requirement.

Proposals for the creative writing concentration should be submitted to the English department office in 107 LC or online as directed on the department website, during the designated sign-up period in the term before enrollment is intended.

SENIOR REQUIREMENTS

Seniors must complete a two-course senior requirement consisting of one of the following combinations: (1) two senior seminars; (2) a senior seminar and a one-term senior essay; (3) a two-term senior essay, with permission of the DUS. For students in the creative writing concentration, the senior requirement is a senior seminar or one-term senior essay and ENGL 4400, the senior project in the creative writing concentration. Each English major must make an appointment to meet with Yale's Librarian for Literature in English or another research librarian within the first four weeks of the term during which the student is fulfilling the first part of the two-term requirement for the major. A junior seminar in which the student, with the permission of the DUS and of the instructor, fulfills the senior requirement may be counted as a senior seminar. At the start of term the student must arrange with the instructor to do any additional work necessary to make the course an appropriate capstone experience.

Senior seminar Senior seminars are designated "Senior Seminar" in the course listings, but they are open to interested juniors, as well. The final essays written for senior seminars are intended to provide an appropriate culmination to the student's work in the major and in Yale College. Such essays should rest on significant independent work and should be of substantial length. In researching and writing the essay, the student should consult regularly with the seminar instructor, and may consult with other faculty members as well. Senior seminars may only be counted toward the requirement beginning in the sixth semester of a student's course of study.

Senior essay The senior essay is an independent literary-critical project on a topic of the student's own design, which is undertaken in regular consultation with a faculty adviser. Writing a senior essay provides a structure for English majors who want the opportunity to explore a research topic in a more sustained and intensive way, as well as a community of support that many majors find rewarding. It should ordinarily be written in an area on which the student has focused in previous studies. It may be written during one or two terms; single-term essays may be converted to two-term essays through application to the DUS. See the course listings for ENGL 4100 and 4101 for procedures. Students fulfilling the senior requirement through a two-term senior essay or through a senior essay and the senior creative writing concentration project must take a seminar during their senior year, but it need not be a senior seminar.

Prospectuses and applications for senior essays should be submitted to the office of the English department in 107 LC or online as directed on the department website, during the designated sign-up period in the term before enrollment is intended.

ADVISING

Students planning a program of study in English are strongly encouraged to consult a faculty adviser in the English department, the departmental representative in their residential college, or the DUS or Associate DUS for advice about their course choices.

By the fall of the junior year, each English major will have been formally assigned or have chosen a faculty adviser from the English department, and in consultation with that adviser completes a statement outlining progress in the major. Course schedules for all majors should be discussed with and approved by their faculty advisers. The DUS and the Associate DUS can also discuss and approve schedules, if necessary.

For interdepartmental programs that include courses covering English literature, see Comparative Literature; Directed Studies; American Studies; African American Studies; Ethnicity, Race, and Migration; Theater, Dance, and Performance Studies; and Women's, Gender, and Sexuality Studies.

Graduate school Students considering graduate work in English should be aware that a reading knowledge of certain classical and modern European languages is often required for admission to graduate study, and that a course orienting them to critical theory can be especially helpful preparation.

Combined B.A./M.A. degree program Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in English Language and Literature.

SUMMARY OF MAJOR REQUIREMENTS

Number of courses *Standard major*—14 courses (incl senior req); *Creative Writing concentration*—15 courses (incl senior req)

Distribution of courses 3 courses chosen from ENGL 1025, 1026, 1027, and 1028; 1 course in each of four historical periods as specified (intro courses do not fulfill this requirement); 1 junior seminar; *Creative Writing concentration*—same, except 4 designated creative writing courses including at least 2 4000-level workshops (previously, numbered 451 or higher) that require an application with a writing sample, one in the same genre as ENGL 4400; and 1 in another genre; at least 11 literature courses

Substitutions permitted DRST 0001 and 0002 or ENGL 1029 and 1030 may substitute for one foundational course (but count as two courses toward the major.) With DUS permission: two upper-level courses with overlapping material may substitute for one foundational course; up to 2 relevant upper-level courses in other departments may substitute for electives in the major; Residential College Seminars may substitute for electives in the major

Senior requirement *Standard major*—2 senior sems, or 1 senior sem and 1 senior essay (ENGL 4100), or a two-term senior essay (ENGL 4100, 4101); *Creative Writing concentration*—senior sem or senior essay, and ENGL 4400

All seniors must meet with a research librarian in the first term of their senior requirement.

FACULTY OF THE DEPARTMENT OF ENGLISH

Professors Jessica Brantley, David Bromwich, Ardis Butterfield, Jill Campbell, Joe Cleary, Jacqueline Goldsby, Langdon Hammer, Margaret Homans, Cajetan Iheka, Jonathan Kramnick, Stefanie Markovits, Feisal Mohamed, Stephanie Newell, Catherine Nicholson, John Durham Peters, Caryl Phillips, Marc Robinson, Caleb Smith, Katie Trumpener, Shane Vogel, Michael Warner, R. John Williams, Ruth Yeazell

Associate Professors Joseph North, Juno Richards, Emily Thornbury, Sunny Xiang

Assistant Professors Anastasia Eccles, Marcel Elias, Jonathan Howard, Elleza Kelley, Naomi Levine, Joseph Miranda, Ernest Mitchell, Priyasha Mukhopadhyay, Joseph North, Juno Richards, Nicole Sheriko, Lloyd Sy

Professors in the Practice Alison Bechdel, Michael Cunningham, Anne Fadiman, Donald Margulies, Meghan O'Rourke

Senior Lecturers James Berger, Leslie Brisman, Richard Deming, Peter Grund, Heather Klemann, Cynthia Zarin

Lecturers Felisa Baynes-Ross, Marie-Helene Bertino, Kate Bolick, Steven Brill, Alan Burdick, Lincoln Caplan, Danielle Chapman, Alison Coleman, Susan Dominus, Andrew Ehrgood, Craig Eklund, Greg Ellermann, Randi Epstein, Amity Gaige, Rona Johnston Gordon, Derek Greene, Jacob Halpern, Christopher Hawthorne, Samuel Huber, Rosemary Jones, Rachel Kauder Nalebuff, Verlyn Klinkenborg, Timothy Kreiner, Sarah Mahurin, Christopher McGowan, Maggie Millner, Carol Tell Morse, Pamela Newton, Barbara Riley, Timothy Robinson, Pamela Schirmeister, Adam Sexton, Kim Shirkhani, Steven Shoemaker, Emily Skillings, R. Clifton Spargo, Margaret Spillane, Sarah Stillman, Jennifer Stock, James Surowiecki, Rasheed Tazudeen, Aaron Tracy, Seth Colter Walls, Ryan Wepler, Christian Wiman

Environment

At Yale, the environment is studied from a variety of perspectives. Majors are offered in Architecture, Chemical Engineering, Ecology and Evolutionary Biology, Environmental Engineering, Environmental Studies, Earth and Planetary Sciences and Urban Studies. The program in Environmental Studies offers courses in environmental science, policy, and management. Many other departments and programs offer courses pertinent to the study of environment, including American Studies, Anthropology, Chemistry, Economics, English, Global Affairs, History, History of Art, Political Science, and Sociology. Some professional schools and programs offer relevant courses that may admit undergraduates, including the School of Public Health, the School of the Environment, the Law School, and the School of Management.

Environmental Engineering

Director of undergraduate studies: Drew Gentner (drew.gentner@yale.edu); seas.yale.edu/departments/chemical-and-environmental-engineering

Environmental engineering encompasses the scientific assessment and development of engineering solutions to environmental problems affecting land, water, and air (the biosphere). The field addresses broad environmental issues, including the safety of drinking water, groundwater protection and remediation, wastewater treatment, indoor and outdoor air pollution, climate change, solid and hazardous waste disposal, cleanup of contaminated sites, the prevention of pollution through product and process design, and strategies for sustainable water and energy use and production.

Environmental engineers must balance competing technical, social, and legal issues concerning the use of environmental resources. Because of the complexity of these challenges, environmental engineers need a broad understanding not only of engineering disciplines but also of chemistry, biology, geology, and economics. Accordingly, the program allows students in the major to select an emphasis on environmental engineering technology, sustainability, global health, economics, or energy and climate change. The program prepares students for leadership positions in industry and government agencies or for further studies in engineering, science, business, law, and medicine.

Two degree programs are offered: the B.S. in Environmental Engineering, and the B.A. in Engineering Sciences (Environmental). The B.S. degree program in Environmental Engineering is designed for students who desire a strong background in environmental engineering leading to a career in the field. The B.A. degree program in Engineering Sciences (Environmental) is intended for students whose careers will involve, but not be dominated by, the skills of environmental engineering. The B.A. program is appropriate for those contemplating a career in which scientific and technological problems can play an important role, as is often the case in law, business, medicine, or public service.

Students are held to the requirements in place when they declared their major. However, with approval from the director of undergraduate studies (DUS), the following prerequisites and major requirements, updated for the academic year 2023-2024, may be fulfilled by students who declared the major in a prior term.

PREREQUISITES

B.A. degree program in Engineering Sciences (Environmental) The B.A. degree program requires MATH 1120 and MATH 1150; a two-term lecture sequence in chemistry; and PHYS 1700, 1710.

B.S. degree program in Environmental Engineering The B.S. degree program has the following prerequisites in mathematics and basic sciences: MATH 1120, MATH 1150; MATH 1200 or ENAS 1510; ENAS 1940; ENAS 1300 or S&DS 2300; a two-term lecture sequence in chemistry, with corresponding labs; PHYS 1800, 1810; BIOL 1010 and BIOL 1020 or BIOL 1030 and 1040.

REQUIREMENTS OF THE MAJOR

B.A. degree program The B.A. degree program requires nine term course credits beyond the prerequisites, including the senior requirement. Students take ENVE 1200, ENVE 3600, and either ENVE 3730 or 3770. Five electives must be chosen in consultation with the director of undergraduate studies (DUS). Elective courses may build toward an optional concentrated area of emphasis, including (a) Climate and Energy, (b) Environmental Science and Technology, (c) Sustainability and Policy, and (d) Self-designed.

B.S. degree program The B.S. degree program requires at least thirteen term course credits beyond the prerequisites, including the senior requirement. Students take CENG 3000 or MENG 2511; ENVE 1200; 3600; 3730; 3140 or 4480; 4380; 4410; and ENVE 6420. At least four electives must be chosen in consultation with the DUS; of these, three must be technical electives. Elective courses may build toward an optional concentrated area of emphasis, including (a) Climate and Energy, (b) Environmental Science and Technology, (c) Sustainability and Policy, and (d) Self-designed.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval

SENIOR REQUIREMENT

B.A. degree program Students in the B.A. program must pass ENVE 4160 or ENVE 4900 in their senior year.

B.S. degree program Students in the B.S. program must pass ENVE 4160 or ENVE 4900 in their senior year.

SUMMARY OF MAJOR REQUIREMENTS

ENGINEERING SCIENCES (ENVIRONMENTAL), B.A.

Prerequisites MATH 1120, 1150; two-term lecture sequence in chemistry; PHYS 1700, 1710

Number of courses 9 term courses beyond prereqs (incl senior req)

Specific courses required ENVE 1200; ENVE 3600; and ENVE 3730 or 3770

Distribution of courses 5 electives approved by DUS

Senior requirement ENVE 4160 or ENVE 4900

ENVIRONMENTAL ENGINEERING, B.S.

Prerequisites MATH 1120, MATH 1150; MATH 1200 or ENAS 1510; ENAS 1940; ENAS 1300 or S&DS 2300; two-term lecture sequence in chemistry, with labs; PHYS 1800, 1810; BIOL 1010 and BIOL 1020 or BIOL 1030 and BIOL 1040

Number of courses 13 term courses beyond prereqs (incl senior req)

Specific courses required CENG 3000 or MENG 2511; ENVE 1200; 3600; 3730; 3140 or 4480; 4380; 4410; 6420

Distribution of courses 4 electives approved by DUS, three of which must be technical electives

Senior requirement ENVE 4160 or ENVE 4900

FACULTY ASSOCIATED WITH THE PROGRAM IN ENVIRONMENTAL ENGINEERING

Professors Paul Anastas (*Forestry & Environmental Studies*), Michelle Bell (*Forestry & Environmental Studies*), Ruth Blake (*Geology & Geophysics*), Menachem Elimelech (*Chemical & Environmental Engineering*), Edgar Hertwich (*Forestry & Environmental Studies*), Edward Kaplan (*School of Management*), Jaehong Kim (*Chemical & Environmental Engineering*), Jordan Peccia (*Chemical & Environmental Engineering*), Lisa Pfefferle (*Chemical & Environmental Engineering*), Julie Zimmerman (*Chemical & Environmental Engineering*)

Associate Professors John Fortner (*Chemical & Environmental Engineering*), Drew Gentner (*Chemical & Environmental Engineering)*

Environmental Studies

Directors of undergraduate studies: Michael Fotos (michael.fotos@yale.edu) for B.A. students, Kealoha Freidenburg (kealoha.freidenburg@yale.edu) for B.S. students; www.yale.edu/evst

Environmental Studies offers the opportunity to examine human relations with their environments from diverse perspectives. The major encourages interdisciplinary study in (1) social sciences, including anthropology, political science, law, economics, and ethics; (2) humanities, to include history, literature, religion, and the arts; and (3) natural sciences, such as biology, ecology, human health, geology, and chemistry. Students work with faculty advisers and the directors of undergraduate studies (DUS) to concentrate on some of the most pressing environmental and sustainability problems of our time: energy and climate change, food and agriculture, urbanism, biodiversity and conservation, human health, sustainable natural resource management, justice, markets, and governance.

Students may pursue either a B.A. or a B.S. degree within Environmental Studies. The B.A. program is intended for students who wish to concentrate in the social sciences and humanities. The B.S. program is intended for students interested in the natural sciences, especially fields such as environmental health and medicine, ecology, energy and climate change. Both degree programs culminate in a senior essay project that is commonly preceded by independent summer research.

Students must declare a major in Environmental Studies before the end of the second term of junior year.

PREREQUISITES

The B.A. degree program has no prerequisites.

The B.S. degree program has prerequisites in mathematics, chemistry, life sciences, and a natural science lab. The prerequisites include a term course in mathematics, physics, or statistics selected from MATH 1120 or higher, or PHYS 1700 or higher, or S&DS 1000 or higher, or completion of the Certificate in Data Science; the two-term lecture sequence in chemistry or, for students qualifying for advanced placement in chemistry, one term of CHEM 1670 or higher; the two-credit BIOL sequence BIOL 1010, 1020, 1030 and 1040, or EPS 1250; and a natural science lab* such as those listed on the environmental studies website or by searching Yale Course Search (YC EVST BS Natural Sci Lab).

*Students who have taken approved field science courses in Spring 2023 may substitute one such course for the natural science lab prerequisite.

Students in the B.S. program are advised to take chemistry and biology during the first year before enrolling in the EVST core courses in the natural sciences. It is recommended but not required that students complete the prerequisites by the end of their sophomore year.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for Environmental Science major requirements.

B.A. degree program The B.A. degree requires at least fourteen course credits, consisting of the core requirements, the concentration, and the senior requirement.

B.S. degree program In addition to the prerequisites, the B.S. degree requires at least twelve course credits, consisting of the core requirements, the concentration, and the two-term senior requirement.

B.A. core courses One course in statistics or mathematics selected from S&DS 1000 or higher, MATH 1100 and MATH 1110 or MATH 1120 or higher; two core courses in the humanities or social sciences and three core courses in the natural sciences. Students who complete the Certificate in Data Science are relieved of the statistics and mathematics core course requirement. Students may select core courses from among the list of approved core courses posted on the environmental studies website or by searching Yale Course Search (YC EVST Core BA Natural Scie and YC EVST Core Human/Social Sci). Completing one course in each core area before the end of the sophomore year is recommended.

B.S. core courses Two core courses in the humanities or social sciences and two natural science core courses from among the list of approved core courses posted on the environmental studies website or by searching Yale Course Search (YC EVST Core BS Natural Sci and YC EVST Core Human/Social Sci). Completing one course in each area before the end of the sophomore year is recommended.

Areas of concentration Students plan their concentration in consultation with the DUS. A concentration is defined as six courses that provide analytical depth in a particular environmental problem or issue of interest, as well as disciplinary expertise. For the B.A. degree, one of these six courses must be an advanced seminar (YC EVST Advanced Seminar) that exposes students to primary literature, extensive writing requirements, and experience with research methods. For the B.S. degree, two of the six courses must provide interdisciplinary context to the concentration and three of the six courses must have the science (SC) distributional designation. Of the three SC-designated concentration courses in the B.S. degree program, at least two must have departmental numerical ratings of 1250 or higher. Concentrations include biodiversity and conservation, climate change and energy, environmental humanities, environmental justice, environmental policy, food and agriculture, human health and environment, sustainability and natural resources, and urban environments. Students also can design a unique concentration within the major, in consultation with the DUS.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

B.A. degree program For the B.A. degree, students most often complete one term of EVST 4960, a colloquium in which they write their senior essay. Students writing the one-term essay must also complete an additional advanced seminar in the environment. The additional advanced seminar is in addition to the six-course concentration

requirement. Two-term senior research projects require the permission of the DUS before the end of the second term of the junior year.

B.S. degree program For the B.S. degree, students complete two terms of EVST 4960.

ADVISING

Summer Environmental Fellowship During the spring term, EVST majors may apply for the Summer Environmental Fellowship (SEF) to gain experience in the field through research or internships in an area pertinent to their academic development or their senior essay project. Sophomores and juniors may arrange internships with nonprofit organizations, government agencies, or corporations. Rising seniors typically focus on research for their senior essay. You can find a list of past SEF awards on the Environmental Studies website.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites *B.A.*—no prerequisites; *B.S.*— one statistics, math, or physics course from MATH 1120 or higher, or PHYS 1700 or higher, or S&DS 1000 or higher, or completion of the Certificate in Data Science; two-term lecture sequence in chemistry, or CHEM 1670 or higher; BIOL 1010, 1020, 1030 and 1040, or EPS 1250; and one natural science lab

Number of courses *B.A.*—at least 14 course credits, including the senior req; *B.S.*—at least 12 course credits, beyond prereqs and incl the senior req

Distribution of courses *B.A.*—6 core courses, as specified; 6 courses in area of concentration, including 1 adv seminar as specified; *B.S.*—2 core courses in humanities and social sciences and 2 core courses in natural sciences, as specified; 6 courses in area of concentration, 3 of which must have SC designation with 2 of the 3 numerically rated at 1250 or higher, and 2 must provide interdisciplinary context as specified

Senior requirement *B.A.*—one-term senior essay, EVST 4960 and an adv seminar in the environment or, with petition to the DUS before the end of the junior year, a two-term research project; *B.S.*—two-term research project, EVST 4960

FACULTY ASSOCIATED WITH THE PROGRAM OF ENVIRONMENTAL STUDIES

Professors Mark Ashton (*School of the Environment*), Michelle Bell (*School of the Environment*), Gaboury Benoit (*School of the Environment*), Ned Blackhawk (*History and American Studies*), Mark Bradford (*School of the Environment*), Derek Briggs (*Earth and Planetary Sciences*), Gary Brudvig *(Chemistry, Molecular Biophysics and Biochemistry),* Ingrid Burke (*School of the Environment*), Susan Clark (*School of the Environment, Adjunct*), Deborah Coen (*History*), Michael Donoghue (*Ecology and Evolutionary Biology, School of the Environment*), Michael Dove (*School of the Environment, Anthropology*), Robert Dubrow *(School of Public Health),* Anna Dyson *(Architecture, School of Environment),* Keller Easterling (*Architecture*), Menachem Elimelech (*Chemical Engineering, Environmental Engineering*), Daniel Esty (*School of the Environment, Law School*), Eduardo Fernandez-Duque (*School of the Environment*), Walter Jetz (*Ecology and Evolutionary Biology, School of the Environment*), Ben Kiernan (*History*), Matthew Kotchen (*School of the Environment*, *Economics*), Douglas Kysar (*Law School*), William Lauenroth (*School of the Environment*), Xuhui Lee (*School of the Environment*), Robert Mendelsohn (*School of the Environment, Economics*), Alan Mikhail (*History*), Jeffrey Park (*Earth and Planetary Sciences*), Peter Perdue (*History*), Stephen Pitti (*History, American*

Studies), Alan Plattus (*Architecture*), David Post (*Ecology and Evolutionary Biology*), Jeffrey Powell (*Ecology and Evolutionary Biology, School of the Environment*), Daniel Prober (*Applied Physics, Electrical Engineering, and Physics),* Peter Raymond (*School of the Environment*), Paul Sabin (*History*), James Saiers *(School of the Environment),* Oswald Schmitz (*School of the Environment, Ecology and Evolutionary Biology*), Karen Seto (*School of the Environment*), Kalyanakrishnan Sivaramakrishnan (*Anthropology, School of the Environment*), David Skelly (*School of the Environment, Ecology and Evolutionary Biology*), Stephen Stearns (*Ecology and Evolutionary Biology*), Dorceta Taylor (*School of the Environment*), Gerald Torres (*School of the Environmen*t, *Law*), Paul Turner *(Ecology and Evolutionary Biology),* John Wargo (*School of the Environment*), John Warner (*History of Medicine, American Studies, History*), Michael Warner (*English, American Studies*), Harvey Weiss (*Near Eastern Languages and Civilizations, Anthropology*), Carl Zimmer (*Molecular Biophysics and Biochemistry, Adjunct*) Julie Zimmerman (*Chemical Engineering, Environmental Engineering*)

Associate Professors Laura Barraclough (*American Studies*), Craig Brodersen (*School of the Environment*), Marian Chertow (*School of the Environment)*, Kenneth Gillingham (*School of the Environment, Economics, School of Management*), Jennifer Raab (*History of Art*), Elihu Rubin (*Architecture*), Carla Staver (*Ecology and Evolutionary Biology*), David Vasseur (*Ecology and Evolutionary Biology*)

Assistant Professors Anjelica Gonzalez (*Biomedical Engineering*), Krystal Pollitt (*Engineering and Applied Science*), William Rankin (*History, History of Science*)

Senior Lecturers Shimon Anisfeld, Carol Carpenter, Amity Doolittle, John Grim, Mary Evelyn Tucker, Marta Wells

Lecturers Alan Burdick, Mary Beth Decker, Marlyse Duguid, Michael Fotos, Kealoha Freidenburg, Gordon Geballe, Robert Klee, Linda Puth, Catherine Skinner

Ethics, Politics, and Economics

Director of undergraduate studies: Gregory Collins (gregory.collins@yale.edu); epe.yale.edu

The major in Ethics, Politics, and Economics joins the analytic rigor of the social sciences and the enduring normative questions of philosophy to promote an integrative and critical understanding of the institutions, practices, and policies that shape the contemporary world.

INTRODUCTORY REQUIREMENTS

Students must successfully complete eight introductory courses before they can declare as an EP&E major. Students are very strongly encouraged to complete these introductory courses before the beginning of their fifth semester, because of the demands of the overall EP&E course load and the related need to demonstrate ability to complete the major.

After completion of introductory requirements, students may declare the EP&E major, following the process outlined on the EP&E website.

Introductory courses required to declare the Ethics, Politics, and Economics major include the following:

1. The Ethics course PHIL 1175 or Directed Studies*

2. A course in Other Perspectives, from disciplines such as Anthropology; Ethnicity, Race, and Migration; History; Sociology; Women's, Gender, and Sexuality Studies; or Directed Studies*

3. A course in Political Philosophy, choosing from PHIL 1178, PLSC 1327, 1335, 1352, or Directed Studies*

*Students completing two full terms of Directed Studies fulfill the first three introductory requirements.

4. A Political Science introductory course in one of the following Political Science subfields: international relations (PLSC 1113), comparative politics (PLSC 1413), or American politics (PLSC 1222)

5. A course in Introduction to Microeconomics, choosing from ECON 1108, ECON 1110 or ECON 1115

6. A course in Introduction to Macroeconomics, choosing from ECON 1111 or ECON 1116

7. A course in Econometrics, choosing from ECON 1117, 2123, 2135, GLBL 2121, S&DS 2300, or S&DS 2380

8. A course in Game Theory, choosing from EP&E 4220, 4231, 4295, 4297, or ECON 2159

MAJOR REQUIREMENTS

See Links to the attributes indicating courses approved for Ethics, Politics, and Economics major requirements.

Students must take fifteen term courses including eight introductory requirements; Intermediate Microeconomics (ECON 2121 or 2125); three core seminars with one selected from the Classics series of EP&E courses (EP&E 3212, 3213, 3214, 3215, 3216, or 3217) and the remaining two seminars selected from two of the three core areas of the major (Ethics, Politics, Economics); and three courses in the chosen area of concentration (which includes the senior requirement).

Intermediate microeconomics Students must take ECON 2121 or ECON 2125.

Core courses The major requires that students take three core courses: one course selected from EP&E 3212, 3213, 3214, 3215, 3216, or 3217 and two additional core courses from the major's three core areas (Ethics, Politics, Economics), one of which must be an advanced seminar anchored in at least two of the major's three core areas of ethics, politics, or economics. The approved core courses, specified annually, can be found on a list of approved EP&E core courses on the EP&E website and by searching Yale Course Search for the following attributes: YC EP&E Ethics Core; YC EP&E Politics Core; YC EP&E Economics Core.

Areas of concentration Each student defines an area of concentration with review by the DUS by the end of their junior year. The concentration enables students to frame an important problem and shape a systematic course of inquiry, employing analytical methods and substantive theories drawn from the three fields. For many students, the concentration treats a contemporary problem with a substantial policy dimension (domestic or international), but some students may wish to emphasize philosophical and methodological issues. The area of concentration culminates in the senior essay.

Areas of concentration must consist of three courses appropriate to the theme, including the seminar or independent study course in which the senior essay is written (see "Senior Requirement" below.) At most, one of these three courses may be a lecture course. In designing the area of concentration, students are encouraged to include seminars from other departments and programs (see "graduate work" below.) Students are encouraged to include a seminar or a lecture that covers advanced research design and/or data analysis when the area of concentration requires it.

The following are examples of possible areas of concentration: distributive justice, government regulation of market economies, environmental policy, philosophy of law, gender relations, democracy and multiculturalism, contemporary approaches to public policy, war and coercion, war crimes and crimes against humanity, medical ethics, international political economy, philosophy of the social sciences, social theory and ethics, cultural analysis and political thought, and civil society and its normative implications. However, students may wish to frame their own area of concentration more precisely.

Credit/D/Fail No more than one course taken Cr/D/F may be applied to the requirements of the major, excluding the seminar in which the senior essay is written. Courses that count toward major requirements do count as non-A grades in calculations for Distinction in the Major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

A senior essay is required for the major and should constitute the intellectual culmination of the student's work in Ethics, Politics, and Economics. The essay should fall within the student's area of concentration. Students may enroll in EP&E 4491 to write a term-long essay; or in EP&E 4492 and EP&E 4493 to write a year-long essay. They must secure the approval of a faculty member who will serve as advisor for the essay. Alternatively, students may write their essay within a relevant seminar, with the consent of the seminar instructor to serve as the essay adviser, and approval of the DUS.

The senior essay reflects more extensive research than an ordinary Yale College seminar paper and employs a method of research appropriate to its topic. Some papers might be written entirely from library sources; others may employ field interviews and direct observation; still others may require statistical or econometric analysis. The student should consult frequently with the seminar instructor or adviser, offering partial and preliminary drafts for criticism. Students are encouraged to incorporate analysis using the tools of all three of the major's fields.

Senior essays written in the fall term are due in early December. Senior essays written in the spring term and yearlong essays are due in mid-April. One-term essays are normally expected to be 40–50 pages in length; yearlong essays are normally expected to be 80–100 pages in length.

GRADUATE WORK

Some graduate and professional school courses are open to qualified undergraduates and may be of interest to EP&E majors, especially as potential concentration courses (e.g., courses in the Schools of Nursing, Forestry and Environmental Studies, Management, and Public Health). Permission to enroll is required from the instructor as well as the appropriate representative of the graduate or professional program. EP&E requires that graduate and professional school courses carry one full Yale College course credit, and it is important to note that not all such courses yield a full course credit in Yale College. See Academic Regulations, section L, Special Academic Arrangements, "Courses in the Yale Graduate and Professional Schools."

SUMMARY OF MAJOR REQUIREMENTS

Introductory requirements 8 introductory courses as indicated

Number of courses 15 (including intro courses and senior requirement)

Specific courses required ECON 2121 or ECON 2125

Distribution of courses 3 core seminars (one of which is EP&E 3212, 3213, 3214, 3215, 3216, or 3217) and 2 from the 3 core areas, one of which must be an advanced seminar; 3 concentration courses including the senior requirement course

Senior requirement Senior essay in area of concentration (in an advanced seminar or EP&E 4491, or EP&E 4492 and EP&E 4493)

FACULTY ASSOCIATED WITH THE PROGRAM OF ETHICS, POLITICS, AND ECONOMICS

Director: Ana de la O *(Political Science)*

Professors David Cameron (*Political Science*), Stephen Darwall (*Philosophy*), Bryan Garsten (*Political Science*), Jacob Hacker (*Political Science*), Gregory Huber *(Political Science),* Shelly Kagan (*Philosophy*), Giovanni Maggi (*Economics*), William Nordhaus (*Economics*), Gerard Padro *(Economics, Political Science),* John Roemer *(Political Science),* Ian Shapiro *(Political Science),* Tony Smith, *(Economics),* Jason Stanley (*Philosophy*), Peter Swenson *(Political Science),* Steven Wilkinson (*Political Science*)

Lecturers Gregory Collins *(Political Science),* Kevin Elliott *(Political Science),* Michael Fotos *(Political Science),* Karen Goodrow (*Political Science*), Stephen Latham (*Political Science*), Mordechai Levy-Eichel *(Political Science),* Max Lewis *(Political Science),* Daniel Schillinger *(Political Science)*

Ethnicity, Race, and Migration

Director of undergraduate studies: Albert Laguna (albert.laguna@yale.edu) [spring 2025]; ER&M website

The program in Ethnicity, Race, and Migration enables students to engage in an interdisciplinary, comparative study of forces that have created a multicultural, multiethnic, and multiracial world. The major emphasizes familiarity with the intellectual traditions and debates surrounding the concepts of indigeneity, ethnicity, nationality, and race; grounding in both the history of migration and its contemporary manifestations; and knowledge of and direct engagement with the cultures, structures, and peoples formed by these migrations.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Ethnicity, Race, and Migration major requirements.

Students must complete twelve term courses in Ethnicity, Race, and Migration, including the senior requirement. These twelve normally include ER&M 2000, an introductory course on the issues and disciplines involved in the study of ethnicity, race, and migration. In the junior year, all majors are required to take ER&M 3000, a seminar that introduces majors to scholarship in ethnic studies, postcolonial studies, and cultural studies. Students may take up to two courses required for the major in other departments, if the courses have content related to topics of ethnicity, race, and migration. These courses must be approved by the DUS.

Area of interest In consultation with the director of undergraduate studies (DUS), each student defines an area of interest consisting of six term courses, one of which must be a methods course; these interest area courses do not include the senior essay or project. Advanced work in a language related to a student's area of interest is advised.

Credit/D/Fail No more than two courses taken Credit/D/Fail may be applied toward the requirements of the major with permission of the DUS. ER&M 3000 and courses counting toward the senior requirement may not be taken Credit/D/Fail.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

There are two options for the senior requirement. Majors may choose a yearlong senior essay or project and take the senior colloquium (ER&M 4091) on theoretical and methodological issues in the fall and then complete the requirement by writing a senior essay in the senior project seminar (ER&M 4092) during the spring term. Alternatively, students may take two upper-level ER&M seminars, and in one of the seminars, with the instructor's approval, write a final paper of 20-25 pages in addition to completing other course requirements. These seminars may be taken during either the fall or spring term.

ADVISING

Prospective majors should consult the DUS early in their academic careers to discuss an individual plan of study. Enrollment in the major requires permission of the DUS before the beginning of the fall term of the junior year.

As a multidisciplinary program, Ethnicity, Race, and Migration draws on the resources of other departments and programs in the University. Students are encouraged to examine other departments' offerings in the humanities and the social sciences, interdisciplinary programs of study housed in the MacMillan Center and elsewhere, and Residential College Seminars for additional relevant courses. The stated area of interest of each student determines the relevance and acceptability of other courses. Students are also encouraged to engage in community-based learning opportunities.

STUDY ABROAD

Because of the major's emphasis on international and transnational work, students are encouraged to undertake a term abroad. They should consult with the DUS to identify courses from study abroad programs that may count toward the major.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific courses required ER&M 2000, ER&M 3000

Distribution of courses 6 courses in area of interest, 1 of which must be a methods course; 2 additional courses with ER&M content and DUS approval

Senior requirement Senior colloq (ER&M 4091) and senior essay or project (ER&M 4092); or senior essay in upper-level seminar and one additional upper-level seminar

FACULTY ASSOCIATED WITH THE PROGRAM OF ETHNICITY, RACE, AND MIGRATION

Professors Laura Barraclough (*American Studies*), Ned Blackhawk (*History, American Studies*), Alicia Schmidt Camacho (*Ethnicity, Race, and Migration, American Studies*), Michael Denning (*American Studies, English*), Fatima El-Tayeb (*Ethnicity, Race, and Migration, Women's, Gender, & Sexuality Studies*), Roderick Ferguson (*American Studies, Women's, Gender, & Sexuality Studies*), Daniel Martínez HoSang (*American Studies, Ethnicity, Race, and Migration*), Matthew Jacobson (*American Studies, African American Studies, History*), Grace Kao (*Sociology*), Lisa Lowe (*American Studies*), Mary Lui (*American Studies, History*), Stephen Pitti (*History, American Studies*), Ana Ramos-Zayas (*American Studies, Ethnicity, Race, and Migration, Women's, Gender, & Sexuality Studies*), Kalindi Vora (*Ethnicity, Race, and Migration, Women's, Gender, & Sexuality Studies)*

Associate Professors Zareena Grewal (*American Studies, Ethnicity, Race, and Migration*), Albert Laguna (*American Studies, Ethnicity, Race, and Migration)*

Assistant Professors Tarren Andrews (*Ethnicity, Race, and Migration*), Leigh-Anna Hidalgo (*Ethnicity, Race, and Migration*), Hi'ilei Hobart (*Ethnicity, Race, and Migration*), Sunny Xiang (*English*)

Lecturers Ximena Lopez Carillo (*Ethnicity, Race, and Migration*), Fadila Habchi *(Ethnicity, Race, and Migration*) Quan Tran (*American Studies, Ethnicity, Race, and Migration*)

Visiting Lecturer Gary Okihiro (*Ethnicity, Race, and Migration, American Studies*)

Ethnography Certificate

Certificate director: Jane Lynch (jane.lynch@yale.edu); ethnography.yale.edu

Ethnography is both a set of qualitative research methods employed in the humanities and social sciences and a mode of presenting that research—in books and articles, in film and video, in embodied performance, and, increasingly, in digital formats and multiple media.

REQUIREMENTS

See Links to attributes indicating courses approved for the certificate requirements.

Students must successfully complete six courses. At least four of the six courses must be at the 3000-level or above. At least two of the six courses, including at least one at the 3000-level or above, must include substantial methods training and/or a practical ethnographic component. The minimum grade for all courses is a C.

Courses that fulfill these requirements are listed on the Ethnography Certificate website and are searchable in Yale Course Search (YCS) using the following attributes: YC Ethnography Elective and YC Ethnography Methods. Other courses may be approved by permission of the certificate director.

Students must also attend two public talks or other events that feature ethnography and submit to the certificate director one page critical reflections on each of these talks. The Ethnography Certificate website will maintain updated links to the Ethnography Hub, Ethnography and Social Theory Colloquium series, Workshop in Urban Ethnography, Qualitative Social Science Initiative, and other campus series that regularly feature ethnography-informed events.

Additionally, no more than two course credits may overlap in the fulfillment of the requirements of the Ethnography certificate and of a major, a simultaneous degree, or another certificate; and no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major. Approved graduate and professional school courses may count toward the certificate. Non-Yale courses may not count toward the certificate.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the certificate.

DECLARATION OF CANDIDACY

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Number of courses 6 course credits

Distribution of courses 4 courses at 3000-level or above; 2 courses indicated as methods course with 1 at 3000-level or above

Additional requirements attendance at 2 public talks and submission of 1-page critical reflections for each

Film and Media Studies

Director of undergraduate studies: John Durham Peters (john.peters@yale.edu); filmstudies.yale.edu/undergraduate

The major in Film and Media Studies focuses on the history, theory, criticism, and production of cinema and other moving-image media. Courses examine cinema and the broader landscape of audiovisual media as significant modern art forms, and the contributions of moving-image media as cultural and communicative practices of enduring social significance. As an interdisciplinary program centered in the humanities, Film and Media Studies offers students latitude in defining their course of study within the framework established by the Film and Media Studies Committee. With this freedom comes the responsibility of carefully planning a coherent and well-focused program. Because of the special demands of Film and Media Studies and the diversity of its offerings, potential majors are encouraged to consult the director of undergraduate studies (DUS) early in their academic careers.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Film and Media Studies requirements.

The Film and Media Studies major consists of twelve term courses, including the senior requirement. Students are required to take FILM 1501, FILM 1601 and FILM 3201, preferably by the end of their sophomore year. In addition, students are required to take one upper-level course in the study of representative films from a non-American national cinema (e.g. German expressionist cinema, Italian cinema, or world cinema) and one upper-level course in critical studies: these are designated by attributes (YC FILM World Cinema, YC FILM Critical Studies) in Yale Course Search. Students also must take at least one course on the creative process in film, designated by the attribute YC FILM Production in Yale Course Search. Courses taken outside the Film and Media Studies department do not count toward the major without the permission of the DUS. Admission to senior-level seminars is at the instructor's discretion, but the Film and Media Studies program ensures that every senior major gains admission to the required number of seminars.

The intensive major Students of substantial accomplishment and commitment to film and media studies are encouraged to pursue the intensive major. Students in the intensive major complete a senior project in production and also write a senior essay. The intensive major in Film and Media Studies is intended for students who are not pursuing two majors. Students must request approval from the Film and Media Studies Committee at the end of their junior year by submitting a proposal that outlines their objectives and general area of study.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major with permission of the DUS.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

During the senior year, each student takes one or two senior-level seminars or the equivalent and submits a senior essay or senior project, which should represent a culmination of work in the major and in Yale College. The senior requirement requires both critical writing and writing in images. Those undertaking creative senior projects should be expected to produce a paper of approximately fifteen pages in which the student discusses such questions as the genre to be used in the project, existing precedents for the topic, and his or her strategy in working on the project. Those undertaking to fulfill the senior requirement by writing a senior essay should additionally take a course in which they are expected to do, minimally, a small production assignment.

See the Film and Media Studies website for dates and deadlines for the senior requirement. A second reader assigned by the DUS participates in evaluating the essays and/or projects.

Preparation for a senior project Those students hoping to produce a film script or video as their senior project should make sure that they have taken enough courses in video production and screenwriting to be accepted into an advanced course in screenwriting or production. Senior creative projects in Film and Media Studies must be produced in conjunction with one such upper-level course. Students often start by completing FILM 1610, 1620 by the end of their sophomore year, and continue with FILM 3550, 3560 by the end of their junior year, to prepare for FILM 4550, 4560 or FILM 4830, 4840 in their senior year. Those students interested in screenwriting often begin with FILM 3500. Students interested in filmmaking should also take courses in screenwriting, and vice versa. Some production courses are available in the summer program in Prague.

Senior project Students who wish to complete a senior project as an alternative to an essay must petition the Film and Media Studies Committee for approval of their project at the end of the junior year. Projects might include writing a screenplay in Advanced Screenwriting (FILM 4870, 4880) or producing a video. Students electing such an alternative should note that the project must be undertaken and accomplished over two terms. A limited number of students making films or videos are admitted to either the Advanced Fiction Film Workshop (FILM 4830, 4840) or the Documentary Film Workshop (FILM 4550, 4560), and receive three credits for their projects (two credits for FILM 4830, 4840 or FILM 4550, 4560, and one for FILM 4930 or 4940). Such a choice effectively commits students to one extra course in addition to the twelve courses required for the major, because FILM 4930 or 4940 does not count toward the twelve required courses when taken in conjunction with FILM 4830, 4840 or FILM 4550, 4560. Students may undertake a production project outside the workshops if (1) the Film and Media Studies Committee approves their petition, (2) they have found a primary adviser *qualified* and willing to provide the necessary supervision, and (3) they have identified the equipment necessary to execute the project. Such students may count FILM 4930 and 4940 toward the twelve courses required for the major.

Preparation for a senior essay Students in their senior year may prefer to write a senior essay rather than work on a creative project. To prepare, they should take advantage of the variety of courses in film and media history, criticism and theory

offered by the program, including such topics as American independent cinema, film theory, and African American cinema.

Senior essay For the student writing a senior essay, several options are possible. First, the student may enroll in two terms of relevant senior-level seminars (usually courses numbered in the 4000s) and write a substantial term paper of twenty-five pages, double-spaced, for one of these courses. Second, the student may do independent research on a yearlong senior essay (FILM 4910, 4920). This option is intended for students with clearly defined topics that do not relate closely to a senior-level seminar. Such research receives two terms of credit; the product of a two-term research essay is a work of at least fifty pages. Third, the senior requirement may be completed by combining one single-term senior-level seminar with one term of an independent research project (FILM 4910 or 4920), resulting in a paper of thirty-five pages. Whichever option is chosen, the essay should be written on a topic informed by the student's previous coursework at Yale College. The student intending to write a senior essay should submit a brief prospectus, approved by the proposed faculty adviser, to the DUS by the end of reading week in their junior year. If this petition is approved, the student should plan to submit an updated and elaborated prospectus for final approval by the DUS during the first two weeks of the first term of senior year. In researching and writing the essay, the student should consult regularly with the seminar instructor or adviser, supplying preliminary drafts as appropriate, and may consult with other faculty members as well.

ADVISING

Foreign languages Study of relevant languages is urged for all Film and Media Studies majors. Students considering graduate work should become proficient in French or another modern language. Those choosing to study film in relation to a foreign culture must have good listening and reading abilities in that language.

SUMMARY OF MAJOR REQUIREMENTS

Number of courses 12 term courses (incl senior req)

Specific courses required FILM 1501, FILM 1601 and FILM 3201

Distribution of courses 1 upper-level national or world cinema course as specified; 1 upper level critical studies course; 1 production course

Senior requirement *For senior essay*—2 terms of senior-level seminars, or 2 terms of senior essay (FILM 4910, 4920), or 1 term of a senior-level seminar and one term of FILM 4910 or 4920; *for senior project*—2 terms of senior project in FILM 4550, 4560, or FILM 4830, 4840, and either FILM 4930 or 4940, for a total of 13 term courses; or 2 terms of senior project in FILM 4870, 4880; or 2 terms of senior project in FILM 4930, 4940 *with approved petition*

Intensive major Both senior project in production and senior essay

FACULTY ASSOCIATED WITH THE PROGRAM OF FILM AND MEDIA STUDIES

Professors *Marijeta Bozovic (*Slavic Languages and Literatures, Film & Media Studies, Women's, Gender, and Sexuality Studies*) *Francesco Casetti (*Humanities, Film & Media Studies*), *Marta Figlerowicz (*Comparative Literature, English, Film & Media Studies*) *Aaron Gerow (*East Asian Languages and Literatures, Film & Media Studies*), Brian Kane

(Music, Film & Media Studies), *John MacKay (*Film & Media Studies, Slavic Languages and Literatures*), *Millicent Marcus (*Italian, Film & Media Studies*), *Charles Musser (*American Studies, Film & Media Studies*), *Fatima Naqvi (*German, Film & Media Studies*), *John Durham Peters (*English, Film & Media Studies*), *Katie Trumpener (*Comparative Literature, English, Film & Media Studies*), Laura Wexler (*American Studies, Women's, Gender, and Sexuality Studies*),*R. John Williams (*English, Film & Media Studies*)

Associate Professors Moira Fradinger (*Comparative Literature*), Zareena Grewal (*Ethnicity, Race, & Migration*)

Assistant Professor Neta Alexander (*Film & Media Studies)*

Professor in the Practice Thomas Allen Harris *(African American Studies, Film & Media Studies)*

Senior Lecturer Camille Thomasson (*Film & Media Studies*)

Lecturers Jonathan Andrews (*Art, Film & Media Studies*), Shakti Bhagchandani (*Film & Media Studies*), Oksana Chefranova (*Film & Media Studies*),Claire Demoulin (*Film & Media Studies*), Wanda Strauven (*Film & Media Studies*)

Senior Lector Krystyna Illakowicz (*Slavic Languages and Literatures*)

Visiting Professor Leighton Pierce (*Film & Media Studies*)

*Member of the Film and Media Studies Advisory Committee.

First-Year Seminar Program

The First-Year Seminar Program offers a diverse array of courses open only to first-year students and designed with first-year students in mind. Enrollment in seminars is limited to fifteen or eighteen students, depending on the nature of the course. Most seminars meet twice each week and do not, unless otherwise noted, presume any prior experience in the field.

Course descriptions for first-year seminars can be found in Yale Course Search (under Yale College Attributes). The online listings contain course titles, descriptions, and prerequisites. Course syllabi are available on Canvas@Yale.

Students apply to first-year seminars during registration. Students may only enroll in one first-year seminar per term, with a maximum of two during their first year at Yale College. Special permission is required for exceptions which must be approved by the Director of the First-Year Seminar Program. Auditing is not permitted in first-year seminars.

Food, Agriculture, and Climate Change Certificate

Certificate director: Mark Bomford, (mark.bomford@yale.edu) Yale Sustainable Food Program (YSFP)

This interdisciplinary certificate prepares Yale College students for creative, critical, and unconventional engagement with multiple pressing challenges facing food and agriculture at local and global scales.

Central to the success of this certificate is the Yale Sustainable Food Program (YSFP) and the Yale Farm, which has served as a place of innovative hands-on learning on campus for over twenty years. Learning at the Farm is active, reflexive, embodied, and relational, and these qualities provide an enriching complement to the classroom regardless of the discipline. The YSFP will support those enrolled in the certificate to draw out the important cross-disciplinary connections and contributions they can make to food and agriculture through the lens of their chosen major, even when the subject matter may appear only tangentially related at first appraisal.

REQUIREMENTS

See Links to the attributes indicating courses approved for the certificate requirements.

Students must successfully complete five courses (5 credits) from three areas that reflect the scope of the certificate: food, agriculture, and climate change.

1. **Consumption** (food): 2 required courses; search YC Food Consumption in Yale Course Search. These courses are concerned with the cultivation of plants for harvest as food, feed, fiber, and fuel, and the husbandry or harvest of non-human animals destined for human consumption.
2. **Environment** (climate change): 1 required course; search YC Food Environment in Yale Course Search. These courses concern the broad substrates and surroundings of food and agriculture, particularly those linked to processes of climate change.
3. **Production** (agriculture): 2 required courses; search YC Food Production in Yale Course Search. These courses are concerned with the broad practices of eating, both as essential to human nutrition and health, and also inextricably entwined with cultures, histories, values, identities, politics, and economies.

Students must also participate in 5 co-curricular events identified by the YSFP as directly supporting the academic goals of the certificate and write a 6–8 page (double-spaced) summary. The summary should reflect observations of a recurring theme, an area of controversy, and a proposed resolution. Students should confirm eligibility for these events with the certificate director. The certificate director will provide more information about the scope and format of the written report.

No more than two course credits fulfilling the requirements of the Food, Agriculture, and Climate Change certificate may overlap with a major, a simultaneous degree, or another certificate. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same

course credit may not be used to fulfill the requirements of two certificates and a major. Graduate and professional school courses may count toward the certificate.

Courses accepted by Yale College for full course credit but taken outside of regular fall and spring semesters—for example, in the summer term or during a year abroad—can provisionally count towards satisfying the certificate requirements. Before considering such courses, students should consult with the certificate director.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the certificate.

DECLARATION OF CANDIDACY

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

REQUIREMENTS OF THE CERTIFICATE

Number of courses 5 course credits

Distribution of courses two courses in consumption area; one course in environment area; two courses in production area; 6–8 page summary of five co-curricular events

French

Director of undergraduate studies: Thomas C. Connolly (thomas.connolly@yale.edu); Language program director: Candace Skorupa (candace.skorupa@yale.edu); french.yale.edu

The Department of French has two distinct but complementary missions: to provide instruction in the French language at all levels of competence, and to lead students to a broad appreciation and deep understanding of the literatures and cultures of France and other French-speaking countries.

The major in French is a liberal arts major, designed for those who wish to study French-language literatures, arts, and cultures in depth. The department offers courses devoted to authors, works, and literary and cultural movements that span ten centuries and four continents. The curriculum also includes interdisciplinary courses on relations between literature and other areas of study such as history, law, medicine, religion, philosophy, politics, business, translation, and the arts. Majors are encouraged to explore all periods and genres of literature in French, as well as a wide variety of critical approaches.

Excellent knowledge of a non-English language and a mature, informed appreciation of a non-English literature and culture can open doors to numerous professions. The French major provides ideal preparation for careers in a range of fields from law and diplomacy to journalism, teaching, academia, publishing, business, and the arts. Recent graduates have gone on to selective law schools, medical schools, and graduate programs in French and Comparative Literature. Others work in business, government, primary and secondary education, and a variety of nongovernmental agencies and international organizations.

French can be taken either as a primary major or as one of two majors, in consultation with the director of undergraduate studies (DUS). Regulations concerning the completion of two majors can be found in the Academic Regulations, section L, Special Academic Arrangements, "Two Majors."

COURSE NUMBERING

Group A courses (FREN 1000–1599) This group consists of courses that focus on all levels of language acquisition. Preregistration is required for all Group A courses except FREN 1250 and FREN 1450. FREN 1210 (single-semester L1 and L2) is offered only during the fall term. For this reason, students placed into L1 or L2 who were not enrolled in a fall-term course will have to wait until the next fall to enroll. For further details, students should consult Candace Skorupa, (candace.skorupa@yale.edu) the language program director (LPD).

Group B courses (FREN 1600–4999 taught in French) This group contains more advanced courses that are taught in French and count toward the major. FREN 1600 and FREN 1700 are gateway courses that prepare students for courses numbered 2000 and above. Courses numbered FREN 1800–1999 are advanced-level professional language courses. The 2000–2999 range contains courses devoted to broad, general fields defined by century or genre; the 3000–4999 range contains courses devoted to specific topics within or across those general fields.

Group C courses (FREN 2000–4999 taught in English) This group comprises courses taught in English, although readings may be in French or English. Two courses from this group may be counted for credit toward the standard major.

LANGUAGE PLACEMENT PROCEDURES

The departmental placement exam in French is accessible online. Dates and information for the exam will be available on the French department website, in the Calendar for the Opening Days of College, and on the Center for Language Study website. Placement exam results remain valid for one year.

Students with previous exposure to French but who have not yet studied French at Yale should take the departmental placement exam to ascertain their current level of proficiency, including students who have participated in a non-Yale French language program.

Students who have earned superior scores on standardized tests may be able to enroll in a course designated L5, and should consult with the DUS for further information. The department generally recommends that advanced students of French take the departmental placement exam to be directed to the most appropriate courses. Students who earned a score of 5 on the Advanced Placement exam, a score of 6 or 7 on the advanced-level International Baccalaureate (IB) exam, a rating of C1 on the CEFR European test, or an A or B on the GCE A-level exam are normally placed into a course at the 1500 level and above.

PREREQUISITE

The prerequisite may be fulfilled by taking FREN 1500, which should be taken during the first or second year. In consultation with the DUS, students may instead choose to select a course numbered 1600-4999 to fulfill the prerequisite. Prospective majors are encouraged to take at least one literature course numbered 1700 or above before the end of the second year.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for French major requirements.

The standard major The standard major consists of ten term courses numbered 1600 or above, including a one-term senior essay (see below). One of these ten courses must be FREN 1700 which should be completed early in a candidate's studies, or, in consultation with the DUS, an equivalent course in French from the 2000–4999 range; at least four must be Group B courses numbered 2000 or above. Majors may count no more than two courses in the FREN 1800–1999 range. No more than two courses conducted entirely in English (Group C) may count toward the major. With prior approval of the DUS, a maximum of four term courses taught outside the Yale Department of French but bearing directly on the student's principal interest may be counted toward the major. Up to two of these may be taken in other departments at Yale, and up to four may be taken as part of a year or term abroad, or summer study abroad program. However, the combined number of courses from other departments and from study abroad may not exceed four. The DUS may grant exceptions to this limit for students who spend two academic terms in an approved study abroad program. Relevant first-year seminars may count toward the major, with permission of the DUS.

The intensive major The intensive major is designed for students who wish to undertake a more concentrated study of literature and culture in French. It is recommended for students considering graduate study in French or in a related field. The intensive major consists of twelve term courses numbered 1600 or above, including a one-term or two-term senior essay (see below). At least five courses must be from Group B numbered 2000 or above. The requirement of FREN 1700 (or an equivalent 2000–4999 course), and the stipulations for courses in the 1800–1999 range, courses conducted in English, and courses taken outside the department are identical to those for the standard major.

Period requirement A minimum of one of the ten courses toward the major, or one of the twelve courses toward the intensive major, must deal predominantly with materials from the period preceding 1800. The pre-1800 course may be either a Group B course (taught in French) or a Group C course (taught in English). This requirement applies to all French majors, including those who opt for the standard or intensive translation concentration.

Translation concentration Students may elect to pursue the translation concentration within the French major. Translation concentration majors are expected to take a minimum of two courses in French translation as two of the ten credits required for the standard major, or as two of the twelve credits required for the intensive major. Within the department, this requirement can be fulfilled by taking FREN 3010 and FREN 3012. For their senior requirement, translation concentration students undertake a literary translation project of similar length to the senior essay (see below).

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major (excluding the senior essay requirement).

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with the approval of the DUS.

SENIOR REQUIREMENT

All majors must write a senior essay showing evidence of careful reading, appropriate research, and substantial independent thought. Essays may be written in either French or English and must be prepared under the direction of a ladder faculty member in the Department of French. Students planning to pursue advanced work in French after graduation are encouraged to write their senior essay in French.

Students writing a one-term essay enroll in FREN 4910 in the senior year. A one-term essay may be written in either the fall or the spring term and should be approximately thirty pages in length. A preliminary statement indicating the general area to be addressed and the name of the adviser must be submitted to the DUS by April 14, 2025 (fall-term essay), or November 3, 2025 (spring-term essay). A one-page prospectus and bibliography are due September 12, 2025 (fall term), or January 23, 2026 (spring term). A rough draft must be submitted to the adviser by October 27, 2025 (fall term), or March 23, 2026 (spring term). An electronic copy of the final essay should be sent to the French department registrar by November 28, 2025 (fall term), or April 20, 2026 (spring term).

Students electing a two-term essay must select their subject and adviser before the end of the junior year and enroll in FREN 4930 and FREN 4940 during the senior year. The essay should be around sixty pages in length. A preliminary statement indicating the general area to be addressed and the name of the adviser must be submitted to the DUS by April 14, 2025. A one-page prospectus and bibliography are due September 12, 2025. Students must submit an initial rough draft to their adviser by January 23, 2026, and a complete draft by March 23, 2026. An electronic copy of the final essay should be sent to the French department registrar by April 20, 2026.

Translation concentration majors undertake a literary translation project from French into English of similar length to the senior essay, working with a member of the French department ladder faculty. The senior translation project should include a critical introduction, of a length to be determined by the student in consultation with the directing faculty member. The same submission dates as for the one-term essay and the two-term essay apply to the senior translation project. Translation concentration students should sign up for FREN 4920 for the single-term senior translation project or for FREN 4950 and FREN 4960 for the two-term senior translation project, in the fall and spring terms respectively. Materials submitted for the senior translation project cannot be the same as the materials submitted for any translation courses that count toward a major at Yale College.

ADVISING

All students in the major are encouraged to take as many advanced courses as possible from all historical periods, covering as many genres and critical approaches as possible. As stipulated above, majors are also required to take at least one course dealing predominantly with pre-1800 materials. Candidates for the major should contact the DUS as early as the beginning of the sophomore year and no later than the fall term of the junior year. Students planning to study abroad or to petition for completion of two majors should contact the DUS during the sophomore year.

Special Divisional Major The department will support the application of qualified students who wish to pursue an interdisciplinary course in French studies. Under the provisions of the Special Divisional Major, students may combine courses offered by the French department with courses from other departments. Close consultation with the relevant departmental advisers is required. Candidates for the Special Divisional Major should consult the DUS in French by the fall term of the junior year.

Study abroad Majors are encouraged to spend a term or a year abroad, for which appropriate course credit may be granted. With prior approval of the DUS, summer study abroad may also receive course credit. Further information may be obtained from the Center for International and Professional Experience, from Yale Study Abroad, from the French Department's Study Abroad Coordinator, Constance Sherak (constance.sherak@yale.edu), and from the DUS.

Combined B.A./M.A. degree program Yale College undergraduate students of distinguished ability and extraordinary commitment who are interested in pursuing advanced research in French and Francophone literatures may undertake graduate work for the simultaneous award of the bachelor's and master's degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's

Degrees." Interested students should reach out to the DUS prior to the sixth term of enrollment and consult the B.A./M.A. section on the French department's website.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite FREN 1500 or equivalent as approved by the DUS

Number of courses *Standard major and translation concentration*—10 term courses numbered 1600 or above (including senior essay); *Intensive major and translation concentration*—12 term courses numbered 1600 or above (including senior essay)

Specific course required FREN 1700 or equivalent as approved by the DUS

Distribution of courses *Standard major*—at least 4 courses in Group B numbered 2000 or above; no more than 2 courses numbered FREN 1800–1999; no more than 2 courses conducted in English; one pre-1800 course; *Intensive major*—same as standard, plus 1 additional Group B course numbered 2000 or above; *Translation concentration (both standard and intensive)*— same as standard major with a minimum of two translation courses

Substitution permitted With prior approval of DUS, up to 4 term courses outside French Department, as specified

Senior requirement *Standard major*—one-term senior essay in French or English (FREN 4910); *Translation concentration*—one-term literary translation from French into English (FREN 4920); *Intensive major*—one-term (FREN 4910) or two-term senior essay in French or English (FREN 4930, FREN 4940); *Translation concentration, Intensive major*—one-term senior translation from French into English (FREN 4920) or two-term literary translation from French into English (FREN 4950, FREN 4960)

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The French Department offers a Certificate of Advanced Language Study to Yale College undergraduates who are not French majors.

REQUIREMENTS

Non-majors seeking to earn the Certificate of Advanced Language Study in French are required to take four courses beyond the L4 level, at least two of which must be Yale courses designated as L5. Additionally, the French Department requires that a minimum of one of the four required courses be a French Department course in French listed in the FREN 2000-4999 range. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the DUS, one advanced non-L5 course, conducted in the target language, such as an independent study course (graded pass/fail) or a graduate seminar may count toward certification requirements.

The DUS may allow one "language across the curriculum" (LxC) course taught in English to count toward the certification requirements provided the course includes a weekly discussion section conducted entirely in French, and the student completes all readings and assignments in French. The discussion section must enroll a minimum of three students and the course must be designated as LxC in the course description.

The DUS may also approve up to two study abroad courses taught in French to count as electives toward the certificate requirements. If the DUS approves courses taken

outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure those courses appear on their transcript.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

Any questions relating to the Certificate of Advanced Language Study in French should be directed to the DUS or to the French Department Registrar Bethany Hayes (bethany.hayes@yale.edu).

FACULTY OF THE DEPARTMENT OF FRENCH

Professors R. Howard Bloch, Dominique Brancher, Ardis Butterfield, Marlene L. Daut, Carolyn Dean, Kaiama L. Glover, Alice Kaplan, Pierre Saint-Amand, Maurice Samuels

Associate Professors Morgane Cadieu, Thomas C. Connolly, Jill Jarvis

Senior Lecturer Lauren Pinzka

Senior Lectors Soumia Koundi, Matuku Ngame, Constance Sherak, Candace Skorupa

Lecturer Nichole Gleisner

Lectors Ramla Bedoui, Léo Tertrain, Rachel Watson

German Studies

Director of undergraduate studies: Sophie Schweiger (sophie.schweiger@yale.edu); **Language program director:** Theresa Schenker (theresa.schenker@yale.edu)

The major in German Studies covers a broad tradition of more than five centuries in Germany, Austria, Switzerland, and neighboring lands. Students gain deep competence in the German language while also reading celebrated literature, analyzing distinctive artworks in many media, deducing intensive theories, and exploring political, linguistic, and cultural histories. The German faculty works closely with undergraduates to develop their special areas of interest within the rich currents of German culture.

German language courses emphasize listening, speaking, reading, and writing in interaction with authentic cultural materials. The curriculum also introduces students to the basic questions and methods of literary criticism, with a focus on rigorous reading practices for a wide range of works from different genres, disciplines, and historical moments.

German Studies courses are diverse in their topics and highly relevant to other fields of study today. Pioneers in philosophy, political theory, sociology, psychology, history, classical philology, the visual arts, architecture, and music wrote and thought in German, as did founders of the modern natural and practical sciences. Majors discover Kant, Goethe, Beethoven, Einstein, Freud, Kafka, Arendt, and many other thinkers and writers who laid the groundwork for modernity and still hold keys to understanding it.

Germany is the fourth-largest economy in the world, and German is the first language of over 95 million people worldwide. Students with a foundation in the language, literature, history, and intellectual revolutions of Germany are prepared to enter a wide variety of vocations. Majors have gone on to postgraduate study in Germany and the United States, and many have entered top-tier law schools and graduate programs. Recent graduates work in fields as diverse as environmental policy, journalism, arts management, consulting, and engineering, as well as in governmental and nongovernmental organizations and businesses.

PREREQUISITES

Prerequisite to the major are first- and second-year German or the equivalent.

COURSE NUMBER

Group A courses Courses in Group A (GMAN 1100–1590) correspond to Yale's L1 to L5 designation of elementary, intermediate, and advanced language courses.

Group B courses Courses in Group B (GMAN 1600-level and 1700-level) are advanced L5 courses. Readings are in German, and the language of instruction is German. There is no restriction on the number of Group B courses that may count toward the major, provided all requirements are met.

Group C courses Courses in Group C (above GMAN 2000) are all other courses. The language of instruction is typically English, but readings may be in German and/or English. Course level and prerequisites vary according to the expectations of the instructors.

PLACEMENT PROCEDURES

An online placement examination is accessible all year. See the department website for details. Students may also consult with the director of undergraduate studies (DUS) or the language program director for advice about placement and about language study. Regardless of previous German study, students without a score of 5 on the German Advanced Placement test must take the departmental placement exam in order to enroll in any course above GMAN 1100 or GMAN 1250.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the German Studies major requirements.

Students are held to the requirements that were in place when they declared their major. However, with approval from the director of undergraduate studies, the following requirements, updated for the academic year 2024–2025, may be fulfilled by students who declared the major in a prior term.

The requirements of the major in German Studies consist of ten term courses, including the senior essay. All majors must complete at least one GMAN course numbered in the 1500s, one in the 1600s, and one in the 1700s, plus six additional courses numbered GMAN 1600 and above.

Areas of interest The Yale German Studies program offers a variety of courses. Covered fields include (1) literature, (2) media and media theory, (3) history and politics, (4) critical thought, and (5) aesthetics and the arts. Students are encouraged to select courses based on their preference and may find it rewarding to focus on one or more of these fields. *Literature* courses give students access to worlds of thought and action. Students learn to read critically poetry, novels, plays, short stories, aphorisms, songs, and other genres. *Media and media theory* courses explore a vibrant tradition of experimentation in new cultural forms and media in the nineteenth and twentieth centuries. Students investigate photography, radio, film, television, and computer media alongside landmark works in media theory. Courses in *History and politics* focus on world-altering historical events and thought-altering theories of history from the Germanic tradition. Students become familiar with explosive political and social events, including the emancipation of the Jews and the Holocaust, the world wars, unification and reunification, and concepts and models for development in economy, social welfare, law, and environmental policies. *Critical thought* focuses on traditions of theoretical reflection on society, history, art, and language. Students become familiar with authors such as Kant, Hegel, Marx, Nietzsche, Freud, Benjamin, and Habermas. *Aesthetics and the arts* courses survey the rich Germanic traditions in the visual and musical arts, as well as the philosophical study of art beginning in eighteenth-century Germany.

Credit/D/Fail No more than two courses taken Credit/D/Fail may be applied toward the requirements of the major, with permission of the DUS.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Seniors in the standard German Studies major enroll in GMAN 4920, a guided senior essay tutorial course. Students meet biweekly with the DUS and staff, and work under the direction of a faculty adviser. The culmination of the tutorial is an essay of approximately thirty pages that gives evidence of careful reading and substantial independent thought. The essay may be written in either English or German, although only native speakers are encouraged to write an essay in German. Seniors typically write the essay during the fall term. A preliminary statement indicating the general area to be addressed and the choice of adviser should be submitted to the DUS by early September; the final essay is judged by the faculty adviser and a second reader. See Senior Essay Deadlines on the Department of Germanic Languages and Literatures website for more information.

Intensive major Requirements for the intensive major are the same as for the standard major, except that the intensive major replaces one advanced seminar with a second term of the senior essay. In the fall term seniors in the intensive major enroll in GMAN 4920 and begin work on their project under the guidance and supervision of a faculty adviser. A significant portion of the research for the essay should involve materials in German. The essay may be written in either English or German, although only native speakers are encouraged to write an essay in German. A detailed prospectus, no longer than three pages, and a bibliography must be submitted to the DUS by October 17, 2025. The student must submit a draft of at least fifteen pages of the essay by November 24, 2025, to receive credit for the first term of the course. The second term, GMAN 4930, is devoted to completing the essay, which should be substantial (between fifty and sixty pages); the completed essay must be submitted by April 10, 2026. The senior essay is judged by the faculty adviser and a second reader. See the Department of Germanic Languages and Literatures website for more information.

ADVISING

Candidates for the major in German Studies should consult the DUS.

Graduate courses Courses in the Graduate School are open to undergraduates with permission of the instructor and of the directors of undergraduate and graduate studies. Course descriptions may be obtained on the German department website or from the office of the director of graduate studies.

STUDY ABROAD

Students are strongly encouraged to study in Germany for a summer, or for one or two terms on the Year or Term Abroad program. Appropriate course credit toward the major is granted for work in approved programs in Germany. Study abroad is valuable not only for achieving comfortable fluency in German, but also for gaining firsthand knowledge of the German cultural context. The department offers diverse opportunities for study abroad and a scholarship program for summer courses at German universities. Members of the faculty advise and consult with any students wishing to plan study in Germany. Students who have been approved to study abroad and who receive financial aid from Yale are eligible for aid while abroad. For information about the Year or Term Abroad program, see Academic Regulations, section K, Special Academic Programs, "Year or Term Abroad." Students who study abroad for one term may count up to two courses toward the major, with approval

of the DUS. Students who study abroad for an academic year may count up to four courses toward the major, with approval of the DUS.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites First- and second-year German or equivalent

Number of courses 10 courses (incl senior req)

Distribution of courses At least 1 GMAN course in the 1500s, at least 1 in the 1600s, and at least 1 in the 1700s; 6 courses (numbered GMAN 1600 and above) from Groups B and C

Substitution permitted With DUS approval, some substitutions and exceptions may be possible

Senior requirement Senior essay tutorial (GMAN 4920)

Intensive major Two-term senior essay (GMAN 4920 and GMAN 4930)

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The Department of Germanic Languages and Literatures offers a Certificate of Advanced Language Study in German. A certificate adviser, typically the director of undergraduate studies (DUS), advises students on the certification process. The Certificate of Advanced Language Study, once certified, is listed on the student transcript.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the certificate adviser, one advanced non-L5 course, conducted in the target language, such as an independent study course (graded pass/fail), a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course taught in English to count toward the certification requirements provided the course includes at minimum a weekly discussion section conducted entirely in German. The discussion section must enroll a minimum of three students and the course must be designated as LxC in the course description.

The adviser may also approve the substitution of up to two credits earned during study abroad and taught in German to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure those courses appear on their transcripts.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but

at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY OF THE DEPARTMENT OF GERMANIC LANGUAGES AND LITERATURES

Professors Rüdiger Campe, Rahel Jaeggi (*Visiting Fall 2025),* Fatima Naqvi, Paul North, Brigitte Peucker, Kirk Wetters (*Chair*)

Assistant Professor Sophie Schweiger

Senior Lectors II Marion Gehlker, Theresa Schenker

Lectors Austen Hinkley, Joshua Price

Affiliated Faculty Jeffrey Alexander (*Sociology*), Jennifer Allen (*History*), Seyla Benhabib (*Political Science*), David Cameron (*Political Science*), Paul Franks (*Philosophy, Judaic Studies*), Gundula Kreuzer (*Music*), Patrick McCreless (*Music*), Steven Smith (*Political Science*), David Sorkin (*History*), Nicola Suthor (*History of Art*), Katie Trumpener (*Comparative Literature, English*), Jay Winter (*History*)

Global Affairs

Director of undergraduate studies: Bonnie Weir (bonnie.weir@yale.edu); jackson.yale.edu/academics/the-global-affairs-major/

The Global Affairs major gives students multidisciplinary training to understand and address challenges that we confront as concerned citizens of the world. By their nature, these challenges demand fluency in the approaches and frameworks from multiple disciplines in the social sciences and humanities as well as an ability to translate between scholarship and practice.

The Global Affairs major prepares Yale students for global citizenship and service while giving them the flexibility to shape their own curriculum according to their interests and ambitions. For example, students have concentrated their coursework on human rights and humanitarianism, economic development and poverty, global health, international relations, global environmental policy, and foreign policy and diplomacy, with topics relevant to national and human security.

COURSES FOR NONMAJORS

Most Global Affairs courses are open to both majors and nonmajors. If a Global Affairs course requires an application, the application will be posted on the Jackson School of Global Affairs website.

PREREQUISITES

There are no prerequisites for the Global Affairs major. However, students interested in applying to the major are strongly encouraged to take introductory economics, political science, and history courses as indicated in the Requirements of the Major during their first year and the fall of their sophomore year. Prospective students are also encouraged to work toward the L4 language requirement early in their course planning. All students interested in applying to the Global Affairs major should also plan to take GLBL 2121 in the fall of their sophomore year (and not beforehand). Enrollment in or completion of any introductory courses as well as enrollment in GLBL 2121 are considered at the time of application.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements in place when they were accepted into the Global Affairs major. The following requirements, updated for the academic year 2025–2026, must be fulfilled by students accepted into the major in fall 2025 and beyond.

See Links to the attributes indicating courses approved for Global Affairs major requirements.

Fourteen term courses are required for the major in addition to an L4 language requirement. Students must take introductory microeconomics (ECON 1108, 1110, or 1115) and macroeconomics (ECON 1111 or 1116); two introductory Political Science courses from different subdisciplines: PLSC 1113 (International Relations), PLSC 1413 (Comparative Politics), or one of the following political theory courses: PLSC 1327, 1335, 1352, DRST 0005, or DRST 0006; and two History courses. Students are also required to take two courses in quantitative analysis: GLBL 2121 (Applied Quantitative Analysis I) and GLBL 2122 (Applied Quantitative Analysis II); two advanced courses:

GLBL 3101 (Challenges in Global Affairs) and one course covering game theory (GLBL 2159/ECON 2159), intermediate micro- or macroeconomics (ECON 2121 or ECON 2122), or an approved qualitative methods course (these courses carry the YC GLBL Qualitative Methods attribute). GLBL 2121 and GLBL 2122 may not count as electives. Majors also must take three global affairs electives from an approved group of courses in the departments of Global Affairs, History, Political Science, Economics, or other departments (these courses carry the YC GLBL elective attribute). Finally, students complete a senior project, either in GLBL 4499, a senior Capstone project, or as a senior essay either in a seminar of their choosing or in GLBL 4500, the global affairs senior essay course.

Language requirement Global Affairs majors are required to take a course designated L4 in a modern language other than English.

Credit/D/Fail No course taken Credit/D/Fail may be applied to the requirements of the major, with the exception of a Cr (credit) grade in an L4 language course that may be used to demonstrate proficiency in a foreign language.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Majors have three options to fulfill the senior requirement: They may complete a Capstone project in GLBL 4499, write a senior essay in a substantive seminar, or write a senior essay in the global affairs senior essay course GLBL 4500.

In capstone projects, small groups of students are each assigned to a policy task force in which they apply their academic training to a specific real-world problem relevant to global affairs. Each task force presents its findings and recommendations to an external partner such as a government agency, a nongovernmental organization or nonprofit group, or a private-sector organization in the United States or abroad. Capstones are completed only in the fall of the senior year (or, in the case of fall graduates, in the final semester).

Students may instead choose to complete a senior essay in either the fall or spring term of senior year, either in a substantive seminar of their choice or in the global affairs senior essay course GLBL 4500. Students are responsible for securing their own academic advisor and a secondary reader in either case. Any current faculty member of Yale University may serve as a senior essay advisor and/or secondary reader.

ADVISING AND APPLICATION TO THE MAJOR

Students apply to the Global Affairs major in the fall of the sophomore year. The number of students accepted into the major is limited and selection is competitive. The call for applications is posted each year on the Jackson School of Global Affairs website, circulated through the residential college deans' offices, and noted on the Advising Resources website. For application information, visit the Jackson School of Global Affairs website.

Internships Students in the major are encouraged to take a summer internship in the field of Global Affairs after their junior year. The Jackson School Career Development Office can help students find appropriate internships.

Study Abroad Courses taken at another institution or during a summer or term-time study abroad program may count toward the major requirements with DUS approval after the credit has transferred to Yale. Courses taken abroad may count only as electives or, in rare instances, as introductory courses in the major. Global Affairs majors who plan to study abroad should therefore consult the DUS to devise a course of study prior to the term abroad, and to seek provisional approval for the proposed credit. Up to one summer term course and up to two courses per semester abroad may, with DUS approval, be counted toward the major requirements, with a total limit of four such credits.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 14 (incl senior req; excl lang req)

Specific courses required GLBL 2121; GLBL 2122; GLBL 3101

Distribution of courses 2 introductory Economics courses, one from ECON 1108, ECON 1110, or ECON 1115, and one from either ECON 1111 or ECON 1116; 2 Political Science courses from different subdisciplines, as indicated; 2 History courses; 1 adv course in intermediate micro- or macroeconomics, game theory, or an approved qualitative methods course; 3 approved electives

Language requirement L4 in one modern language other than English

Substitution permitted With DUS approval, GLBL 2121 may be replaced by other analysis courses identified by Global Affairs

Senior requirement GLBL 4499 or GLBL 4500 or in an approved senior seminar

FACULTY ASSOCIATED WITH THE PROGRAM OF GLOBAL AFFAIRS

Professors Lorenzo Caliendo *(Economics, School of Management),* David Engerman (*History*), Jennifer Gandhi *(Political Science),* Pinelopi Goldberg *(Economics, School of Management),* Paul Kennedy (*History*), Amit Khandelwal *(Economics),* James Levinsohn (*Dean*) (*School of Management*), Christopher Neilson *(Economics),* Catherine Panter-Brick (*Anthropology*), Laura Robson *(History),* Ken Scheve (*Political Science)*, Ian Shapiro *(Political Science),* Timothy Snyder (*History*), Aleh Tsyvinski (*Economics*), Arne Westad (*History*)

Associate Professors Kate Baldwin (*Political Science),* Alden Young *(History)*

Assistant Professors Lauren Falcao Bergquist *(Economics),* Mayara Felix *(Economics)*

Senior Lecturers Marnix Amand *(Economics),* Teresa Chahine *(School of Management),* Cara Fallon *(Global Health),* Asha Rangappa, David Simon, Justin Thomas, Bonnie Weir, Edward Wittenstein

Lecturers Eric Braverman, Michael Brenes, Christopher Fussell, Ardina Hasanbasri, Robert Hecht, Phil Kaplan, William Casey King, David Morse, Graeme Reid, Emma Sky, Rory Stewart, Jed Sundwall, Matthew Trevithick, Daniel Wilkinson

Global Health Studies Certificate

Program director and chair: Catherine Panter-Brick; (catherine.panter-brick@yale.edu) **Director of undergraduate studies**: Cara Fallon (cara.fallon@yale.edu); Global Health Studies Program

GLOBAL HEALTH STUDIES CERTIFICATE

The Global Health Studies Program prepares students to critically engage with global health and its multifaceted concerns in contemporary societies. Global health is an interdisciplinary field, and as such, students develop a sophisticated understanding of the roles of politics, history, and economics, engage with the insights of anthropology, ethics, law, and sociology, and relate this knowledge to public health and the biomedical sciences. Students will be expected to complete interdisciplinary coursework to gain a broad understanding of global health research, practice, and leadership.

Students apply to the Program, typically in the fall of their sophomore year. Those accepted into the Program are called "Global Health Scholars." Global Health Scholars are expected to complete interdisciplinary coursework across four global health competency areas chosen from six options: Biological & Environmental Influences on Health (YC GLHTH Bio & Env Influences); Health & Societies (YC GLHTH Health & Societies); Historical Approaches (YC GLHTH Hist Approaches); Performance, Representation & Health (YC GLHTH Perf, Rep & Health); Political Economy & Governance in Health (YC GLHTH Polit Econ & Govern); and Understanding & Interpreting Quantitative Data (YC GLHTH Quantitative Data).

Moreover, in the summer after junior year, Scholars can apply for funding support to pursue mentored experiential learning projects (such as internships, archival work, or field-based research). During their senior year, they enroll in a colloquium course that meaningfully integrates the skills and knowledge acquired throughout the Program.

REQUIREMENTS

See Links to the attributes indicating courses approved for the certificate requirements.

To fulfill the requirements of the program, Scholars must complete the global health introductory lecture course (HLTH 2300), senior colloquium (HLTH 4900), and four elective courses that fulfill four of the global health competency areas. Upon completion of the Global Health Studies Program, Scholars earn a Global Health Studies certificate.

No more than two course credits fulfilling the requirements of the Global Health Studies certificate may overlap with a major, a simultaneous degree, or another certificate. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major.

Qualified undergraduates may take graduate courses at the School of Public Health, subject to restrictions on graduate and professional school enrollment described in Academic Regulations, section L, Special Academic Arrangements. Further information about these courses can be found in the School of Public Health online bulletin. For information about the five-year B.A.–B.S./M.P.H. program offered jointly with the School of Public Health, see Public Health.

Credit/D/Fail No more than 1 course taken Credit/D/Fail may be applied toward the Global Health Studies requirements, with the exception of the Senior Colloquium, which must be taken for a letter grade.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the program requirements with DUS approval.

SUMMARY OF REQUIREMENTS

Prerequisite None

Number of courses 6 courses (incl senior req)

Specific course required HLTH 2300

Distribution of courses 4 electives to achieve four of the six global health competencies as indicated

Senior requirement HLTH 4900, Senior colloquium

Hellenic Studies

Director of undergraduate studies: Maria Kaliambou (maria.kaliambou@yale.edu); Hellenic Studies Program

Hellenic Studies is a program of the European Studies Council. The core of the program is the teaching of modern Greek, supplemented with other courses and events related to the study of post-antiquity Greece, as well as the society and culture of modern Greece and its interaction with the rest of Europe and the world. Related courses can be found in the listings of Anthropology, History, History of Art, Comparative Literature, Political Science, Religious Studies, and Russian and East European Studies. A major in Ancient and Modern Greek is described under Classics. Students who have an interest in post-antiquity Greek language, society, or culture are advised to consult with the director of undergraduate studies.

FACULTY ASSOCIATED WITH THE PROGRAM OF HELLENIC STUDIES

Professor Costas Arkolakis (*Economics*), (*Chair*)

Senior Lector II Maria Kaliambou *(MacMillan Center)*

Senior Lecturer George Syrimis (*MacMillan Center, Comparative Literature*)

History

Director of undergraduate studies: Daniel Magaziner (daniel.magaziner@yale.edu), Humanities Quadrangle, 320 York Street, 2nd Floor, 432-2724; history.yale.edu

The History major is for students who understand that shaping the future requires knowing the past. History courses explore many centuries of human experimentation and ingenuity, from the global to the individual scale. History majors learn to be effective storytellers and analysts, and to craft arguments that speak to broad audiences. They make extensive use of Yale's vast library resources to create pioneering original research projects. Students of history learn to think about politics and government, sexuality, the economy, cultural and intellectual life, war and society, and other themes in broadly humanistic—rather than narrowly technocratic—ways.

History is one of Yale College's most popular and intellectually diverse majors, encompassing nearly every region and time period of the global past. The study of history is excellent preparation for careers in many fields, including law, journalism, business and finance, education, politics and public policy, social activism, and the arts.

COURSE NUMBERING

History undergraduate courses are numbered 0000–4999. The first digit indicates the course's level; courses that begin with 0 (zero) are first-year seminars, with enrollment limited to eighteen. Courses that begin with the number 1 are lectures. Courses that begin with the number 2 are either (a) more advanced lectures, some of which might include WR credit (b) seminars cross-listed with other departments, or (c) reading or historiography focused seminars that do not require substantial work with primary sources. Courses that begin with the number 3 are departmental seminars; these courses combine reading, research, and writing and are intended to prepare students for their Senior Essay. All departmental seminars prioritize History major enrollment and are available for preregistration by History majors. Departmental seminars are capped at fifteen students; many carry WR credit. Courses that begin with the number 4 are senior requirement courses and independent studies.

Each course's second digit indicates its region: x1xx courses explore the history of the United States or Canada; x2xx, Europe, Russia, and Britain; x3xx Africa (Sub-Saharan), x4xx Asia, x5xx Latin America, and x6xx Middle East/North Africa. x7xx courses address comparative, transnational, or global topics. Thus, 16xx indicates a lecture on the Middle East/North Africa, 31xx is a departmental seminar on the United States or Canada, and so on.

PREREQUISITE

The prerequisite for the major is two term courses in History. Courses completed in fulfillment of the prerequisite may be applied toward the requirements of the major. (Directed Studies history and philosophy courses count automatically as history prerequisites.)

REQUIREMENTS OF THE MAJOR

Students are held to the requirements in place when they declared their major. However, with approval from the DUS, the following requirements,

updated for the academic year 2025-2026, may be fulfilled by students who declared the major in a prior term.

See Links to the attributes indicating courses approved for the History major requirements.

Twelve term courses in History are required, including prerequisites and the senior requirement. Upon declaration, all History majors select either the global or the specialist concentration. The global concentration is designed for students seeking a broad understanding of major trends in the history of human societies throughout the world. The specialist concentration is for students seeking to focus in a particular geographic region, such as the United States, or in a thematic pathway, such as empires and colonialism. Majors may change concentrations until the end of the course selection period in the second term of the junior year.

The global concentration requires one course in five of the six different geographic regions (see below). Students must also take two preindustrial courses, covering material before the mid-19th century (and no later than 1900), and two 3000-level departmental seminars.

The specialist concentration requires at least five (and up to eight) courses in a particular geographic region or in a thematic pathway (see list below). Courses appropriate for each region and pathway are listed on the department website. Students must also take at least two courses outside their area of specialization, and their overall coursework must include at least three geographic regions. Like students in the global concentration, students in the specialist concentration must take two preindustrial courses, and at least two 3000-level departmental seminars. Students in the specialist concentration may design an area of specialization with the approval of a faculty adviser and the DUS.

Regions: Africa (Sub-Saharan), Asia, Europe, Latin America, Middle East/North Africa, and United States/Canada.

Pathways: cultural history; empires and colonialism; environmental history; ideas and intellectuals; international and diplomatic history (formerly international history); politics, law, and government (formerly politics and law); race, gender, and sexuality; religion in context; science, technology, and medicine; social change and social movements; war and society; the world economy

Students in either concentration may count the same courses toward geographical, preindustrial, and seminar requirements. For instance, a departmental seminar on premodern Japan simultaneously fulfills the preindustrial, departmental seminar, and Asia geographical requirements.

Departmental seminars All students who declare the History major are entitled to preregister for 3000-level departmental seminars. Many seminars are popular and fill up quickly. Students may use their preregistration privileges at any time after declaring the major, in their sophomore, junior, or senior years. Sophomores contemplating study abroad are urged to consider taking at least one seminar in the sophomore year. Residential College Seminars, study abroad courses, 2000-level seminars and courses in other departments that count toward the History major do not fulfill the departmental seminar requirement, although they can satisfy other requirements (preindustrial,

region, pathway, etc.) Students cannot preregister for 2000-level seminars during departmental preregistration.

Distinction in the major Students who receive an A or A– on the two-term senior essay and who receive the requisite grades in their remaining coursework are awarded Distinction in the Major. (See The Undergraduate Curriculum, Honors.) Students who do not complete the two-term senior essay are not eligible for Distinction.

Credit/D/Fail History majors may count up to two lecture courses or non-3000 seminars taken Cr/D/F toward the requirements of the major. Departmental seminars may not be taken Cr/D/F. (Writers of one-term senior essays may opt to take their 11th term course Cr/D/F. Please see one-term senior essay below.)

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students in the History major are not passive consumers of historical knowledge: they create original works of history themselves. As seniors, History majors complete a work of original research in close consultation with a faculty adviser. The range of acceptable topics and methodological approaches is wide. The aim is to take on study of a significant historical subject through research in accessible primary source materials.

Most students choose to write a two-term independent senior essay, for two course credits toward the major. The two-term essay is required to earn Distinction in the Major. A smaller number of students choose to write an independent one-term senior essay, for one course credit toward the major.

The one-term senior essay History majors may choose to write a one-term independent senior essay during the fall term under the guidance of a faculty adviser. However, students who choose the one-term option are not eligible for Distinction in the Major or history prizes. The one-term essay is a substantial research paper (roughly half the length of the two-term senior essay) based on primary sources, along with a bibliographic essay. Seniors receive course credit for their senior essays by enrolling in HIST 4997 during the first-semester of their senior year. In rare circumstances, with permission of the adviser and senior essay director, a student enrolled in HIST 4997 during the first term may withdraw from the course in accordance with Yale College regulations on course withdrawal and enroll in HIST 4997 during the second term. Even more rarely, students might register for HIST 4997 during their second term, with prior arrangement with both their advisor and the Senior Essay director. Additional details about the senior essay are provided in the Senior Essay Handbook, available on the History website. Students writing a one-term essay must enroll in one additional term course, of any sort, for a total of 12 History credits (11 courses + one-term essay). This additional course can be taken Cr/D/F, bringing the potential total to three such Cr/D/F courses, unless the additional course is a departmental seminar.

The two-term senior essay History majors seeking to earn Distinction in the Major must complete a two-term independent senior essay under the guidance of a faculty adviser. The typical senior essay is 40–50 pages (no more than 12,500 words), plus a bibliography and bibliographical essay. Seniors receive course credit for their

departmental essays by enrolling in HIST 4995 (first term of senior year) and HIST 4996 (second term of senior year). The grade for the final essay, determined by an outside reader in consultation with the faculty adviser, is applied retroactively to both terms. Additional details about the senior essay are provided in the Senior Essay Handbook, available on the History website. History majors graduating in December may begin their two-term senior essay in the spring term and complete the senior essay during fall term.

Additional option for the senior essay Some students embark on the two-term essay but discover that their choice is not a good fit. Students who enroll in HIST 4995 during the first term may opt out in consultation with their faculty adviser and the senior essay director. This decision must be made in accordance with Yale College regulations on course withdrawal. Instead, the student will enroll in HIST 4997 in the spring term to write a one-term senior essay. Students who opt out will not be eligible for Distinction in the Major or History prizes. Additional details about the senior essay are provided in the Senior Essay Handbook, available on the History website.

Alternative senior essay option In addition to the one-semester and two-semester essay, the department will occasionally accept an alternative senior project that is not an extended written essay, with the approval of the Senior Essay Director, an advisor and a second reader. Such alternatives must be based on extensive research with primary and secondary sources. Students completing such projects must consult with experts in their chosen medium, in addition to the faculty members delineated above. Alternative projects will require a proposal (due by the end of the first month of the student's senior year) and a substantial piece of historical writing (~5,000 words) to complement the alternative project. Both components will be considered when assessing and grading the project. These will be two-semester projects only and will be eligible for distinction in the major. Seniors receive course credit for their departmental projects by enrolling in HIST 4995 (first term of senior year) and HIST 4996 (second term of senior year).

Advising All students who declare the History major are assigned an adviser from among the departmental faculty. The adviser is available throughout the year for consultation about courses and the major. Students in the global concentration are assigned an adviser from the general History faculty. Students may request a specific adviser in consultation with the DUS, though the department cannot always accommodate such requests. In addition, a small group of advanced undergraduate students serve as peer advisors and are available to assist students in navigating the major.

Course substitution History majors are permitted to include up to two courses taught outside the department toward fulfillment of the major, with the approval of the DUS. Non-departmental courses may fulfill geographic, region/pathway, and preindustrial distribution requirements. They may not fulfill Departmental Seminar or senior requirements.

Combined B.A./M.A. degree program Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's

Degrees." Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in History.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites 2 term courses in History

Number of courses 12 term courses (incl prereqs and senior req)

Distribution of courses *Both concentrations*—2 courses in preindustrial hist as specified; 2 departmental seminars; *Global concentration*—1 course in 5 of 6 geographical regions (Africa, Asia, Europe, Latin America, Middle East, U.S.); *Specialist concentration*—at least 5 courses in specific region or pathway; overall coursework must include 3 regions

Substitution permitted 1 or 2 non-departmental courses approved by DUS

Senior requirement 1-term senior essay (HIST 4997) or 2-term senior essay (HIST 4995 and 4996), or alternative 2-term senior project (HIST 4995 and 4996), if approved

FACULTY OF THE DEPARTMENT OF HISTORY

Professors Abbas Amanat, Sunil Amrith, Lauren Benton, Ned Blackhawk, David Blight, Edyta Bojanowska, Daniel Botsman, Paul Bushkovitch, Deborah Coen, Carolyn Dean, Fabian Drixler, Marcela Echeverri, Carlos Eire, David Engerman, Paul Freedman, Joanne Freeman, John Gaddis, Beverly Gage, Bruce Gordon, Greg Grandin, Valerie Hansen, Robert Harms, Matthew Jacobson, Gilbert Joseph, Paul Kennedy, Benedict Kiernan, Jennifer Klein, Regina Kunzel, Naomi Lamoreaux, Bentley Layton, Noel Lenski, Kathryn Lofton, Mary Lui, Daniel Magaziner, Joseph Manning, Ivan Marcus, John Merriman, Joanne Meyerowitz, Alan Mikhail, Samuel Moyn, Nicholas Parrillo, Peter Perdue, Mark Peterson, Stephen Pitti, Naomi Rogers, Paul Sabin, Stuart Schwartz, Timothy Snyder, David Sorkin, Harry Stout, John Warner, Arne Westad, John Witt, Keith Wrightson, Taisu Zhang

Associate Professors Paola Bertucci, Rohit De, Marcela Echeverri, Anne Eller, Crystal Feimster, Elizabeth Hinton, Andrew Johnston, Isaac Nakhimovsky, Joanna Radin, William Rankin, Edward Rugemer, Marci Shore, Eliyahu Stern, Jonathan Wyrtzen

Assistant Professors Jennifer Allen, Sergei Antonov, Denise Ho, Jessica Lamont, Ben Machava, Nana Quarshie, Carolyn Roberts

Senior Lecturers Jay Gitlin, William Klein, Stuart Semmel, Rebecca Tannenbaum

Lecturers Sakena Abedin, Ria Chae, Ivano Dal Prete, Suzanne Gay, Maria Jordan, Tyler Kynn, George Levesque, Chitra Ramalingam, Terence Renaud, Miriam Rich

History of Art

Director of undergraduate studies: Craig Buckley, (craig.buckley@yale.edu)
arthistory.yale.edu

Art history is the study of all forms of art, architecture, and visual culture in their social and historical contexts. The History of Art major can serve either as a general program in the humanities or as the groundwork for more specialized training. Unless otherwise indicated, all courses in History of Art are open to all students in Yale College.

COURSE NUMBERING

1000-level courses are broad introductory lecture courses that address basic art history from a number of thematic perspectives. Prospective majors are encouraged, but not required, to take these courses as early in their course of study as possible. Under certain circumstances, students who have taken the Advanced Placement test in art history may earn acceleration credit and, in consultation with the director of undergraduate studies (DUS), may substitute an upper-level class for one required 1000-level course.

Intermediate and advanced courses, numbered above 2000, encompass more specialized surveys and themes in art history.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for History of Art major requirements.

Twelve term courses are required to complete the major: two introductory courses at the 1000 level; four intermediate and advanced courses at the 2000 and 3000 levels; two seminars at the 3500–4497 level; a methods seminar, HSAR 4401; two electives; and the senior essay, HSAR 4499.

The major requires that the six intermediate and advanced courses must satisfy both a geographical and a chronological distribution requirement. These courses must be chosen from four geographical areas and four time periods. The geographical requirement is divided into five areas: Africa and the Pacific; the Americas; Asia and the Near East; Europe; and transregional. The chronological requirement is similarly divided into five segments: earliest times to 800; 800–1500; 1500–1800; 1800 to the present; and transchronological. A single course can fulfill both a geographical and a chronological requirement. Only classes originating in the History of Art department can fulfill the distribution requirements.

Junior seminar The methods seminar HSAR 4401, Critical Approaches to Art History, is a wide-ranging introduction to the practices of the art historian and the history of the discipline. It is to be taken during the fall or spring term of the junior year.

Credit/D/Fail courses No course taken Credit/D/Fail may be applied toward the requirements of the major.

SENIOR REQUIREMENT

The senior essay is a research paper written usually in one term in HSAR 4499. Students choose their own topics, which may derive from research done in an earlier course. The essay is planned during the previous term in consultation with a qualified

instructor and/or with the DUS. It is also possible to write a two-term senior essay, however students wishing to do so must submit a petition to the DUS and the prospective adviser, normally by the first week after spring break of the junior year.

ADVISING

Electives may include courses from other departments if they have direct relevance to the major program of study. Approval of the DUS is required.

History of Art majors are urged to study foreign languages. Students considering graduate work should discuss with their advisers the appropriate language training for their field of interest.

Graduate courses Courses in the Graduate School are open to undergraduates with permission of the instructor and of the director of graduate studies. Course descriptions are available in the History of Art office in the Jeffrey H. Loria Center, 190 York St.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific courses required HSAR 4401

Distribution of courses 2 courses at 1000 level; 6 intermediate or adv courses, as specified, which must fulfill distribution requirements in 4 geographical and 4 chronological categories; 2 electives

Substitution permitted With DUS permission, electives from related depts

Senior requirement Senior essay (HSAR 4499)

FACULTY OF THE DEPARTMENT OF HISTORY OF ART

Professors Carol Armstrong, Tim Barringer, Marisa Bass, Edward S. Cooke, Jr., Milette Gaifman, Jacqueline Jung, Pamela Lee, Jennifer Raab, Kishwar Rizvi, Nicola Suthor, Mimi Yiengpruksawan

Associate Professors Molly Brunson (*Slavic Languages and Literatures*), Craig Buckley

Assistant Professors Nana Adusei-Poku, Allison Caplan, Alexander Ekserdjian, Joanna Fiduccia, Morgan Ng, Quincy Ngan, Catalina Ospina, Justin Willson

History of Science, Medicine, and Public Health

Director of undergraduate studies: Ivano Dal Prete (ivano.dalprete@yale.edu), HQ 253; hshm.yale.edu

History of Science, Medicine, and Public Health is an interdisciplinary program that focuses on how different forms of knowledge and technology have been created in various times, places, and cultures, and how they have shaped the modern world. The major explores a wide range of questions. Is science universal, or does each culture have its own approach to trustworthy knowledge? What is the relationship between medical expertise, social and racial inequality, and everyday life? What is the nature of technology and its relationship to political, economic, and military power? Why do even the best public health campaigns have unintended consequences?

Course topics include the history of American and Western medicine and public health, medicine and race from the slave trade to the present, health and healing in Africa, scientific knowledge production in the global South, institutions of confinement, health activism, biotechnology, the history of the earth sciences, climate change and planetary catastrophe, the scientific revolution, scientific collections, and material culture.

A major in History of Science, Medicine, and Public Health offers excellent preparation for a wide range of careers. Premedical students and others interested in health-related fields can combine preprofessional training with a broad humanistic education. The major also provides a solid foundation for any career at the intersection of the sciences, technology, and public life, including law, business, journalism, museum work, public policy, and government.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the major requirements.

The major in History of Science, Medicine, and Public Health requires twelve term courses (and twelve credits), including the two-term senior requirement. Students select a concentration of seven courses that guide them through an area of specialization. The seven concentration courses must include two courses in History of Science, Medicine, and Public Health; one seminar in History of Science, Medicine, and Public Health or in History; one full-credit science course; and three electives chosen from relevant courses in any department. At least one HSHM (or HIST) seminar must be taken before the senior year.

Concentrations The seven standard concentrations in the major are: Colonialism, Knowledge, and Power; Environment and Society; Gender, Reproduction, and the Body; Media, Information, and the Public; Medicine and Public Health; Minds and Brains; Science, Technology, and Society. Students may also design customized concentrations in consultation with the director of undergraduate studies (DUS). No later than the beginning of the junior year, students in the major must select a standard concentration or indicate that they wish to design their own.

See the Concentrations section for more information.

Electives Beyond the seven concentration courses, students must complete three additional electives in History of Science, Medicine, and Public Health. One of the electives must be a seminar, and one must be chosen from a concentration other than

the one selected for the major. All courses for the major are chosen in collaboration with the student's adviser.

Credit/D/Fail No more than one History of Science, Medicine, and Public Health course taken Credit/D/Fail may be applied toward the requirements of the major, and this course must be taken before the fifth term of enrollment.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students are held to the requirements that were in place when they declared their major. However, with approval from the director of undergraduate studies (DUS), the following senior requirements, updated for the academic year 2024–2025, may be fulfilled by students who declared the major in a prior term.

Students must complete a two-term senior project in HSHM 4900 and 4910. The Senior Project Workshop, HSHM 4200, may be taken as an elective (for half-credit) in addition to HSHM 4900 and 4910. Note, that enrolling in HSHM 4200 will be in addition to the twelve, one-credit courses.

Students select a project adviser, propose a tentative topic and title, and submit a proposal to the senior project director. The final product of the senior requirement may be a written essay or an alternative project such as a film, exhibition, catalog, atlas, or historical data reconstruction. In the case of an alternative project, the student must identify a second reader in addition to the adviser before the senior project director approves the project. The adviser or the second reader must be a faculty member in History of Science, Medicine, and Public Health. A written component of the senior project must illustrate sources and the intellectual significance of the project. For more details about requirements and deadlines, majors should consult the HSHM Senior Project Handbook; copies are available from the senior project director and on the program website.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 courses for 12 credits (incl senior req)

Distribution of courses 7 courses in concentration (incl 2 HSHM courses, 1 sem in HSHM or HIST taken before senior year, 1 full-credit science course, and 3 related electives); 3 addtl HSHM electives, to incl 1 sem and 1 course outside major concentration

Senior requirement Two-term project HSHM 4900 and 4910

CONCENTRATIONS

The seven standard concentrations in the major are: Colonialism, Knowledge, and Power; Environment and Society; Gender, Reproduction, and the Body; Media, Information, and the Public; Medicine and Public Health; Minds and Brains; Science, Technology, and Society. Students may also design customized concentrations in consultation with the director of undergraduate studies (DUS). No later than the

beginning of the junior year, students in the major must select a standard concentration or indicate that they wish to design their own.

Students may find courses that fulfill the requirements of the concentrations in Yale Course Search by searching the "Any Course Information Attribute" dropdown search feature.

Colonialism, Knowledge, and Power (YC HSHM Colonial Know & Power)

Environment and Society (YC HSHM Environ & Society)

Gender, Reproduction, and the Body (YC HSHM Gender, Reprod & Body)

Media, Information, and the Public (YC HSHM Media Info & Public)

Medicine and Public Health (YC HSHM Med & Public Health)

Minds and Brains (YC HSHM Minds and Brains)

Science, Technology, and Society (YC HSHM Sci, Tech & Society)

FACULTY ASSOCIATED WITH THE PROGRAM OF HISTORY OF SCIENCE, MEDICINE, AND PUBLIC HEALTH

Professors Deborah Coen, Naomi Rogers, John Warner

Associate Professors Paola Bertucci, Joanna Radin, William Rankin

Assistant Professors Nana Quarshie, Marco Ramos, Carolyn Roberts

Lecturers Sakena Abedin, Ivano Dal Prete, Ziv Eisenberg, Chitra Ramalingam

Affiliated Faculty Rene Almeling (*Sociology*), Toby Appel (*Yale University Library*), Melissa Grafe (*Yale University Library*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Jessica Helfand (*School of Art*), Marcia Inhorn (*Anthropology*), Kathryn James (*Yale University Library*), Amy Kapczynski (*Law School*), Gundula Kreuzer (*Music*), Amy Meyers (*Yale Center for British Art*), Alan Mikhail (*History*), Ayesha Ramachandran (*Comparative Literature*), Paul Sabin (*History*), Jason Schwartz (*School of Medicine*), Gordon Shepherd (*School of Medicine*), Frank Snowden (*History*), Rebecca Tannenbaum (*History*), R. John Williams (*English*)

Human Rights Studies Certificates

Certificate directors: Bonnie Weir (bonnie.weir@yale.edu) and David Simon (david.simon@yale.edu); https://jackson.yale.edu/academics/human-rights-certificate/

HUMAN RIGHTS STUDIES CERTIFICATES

The Human Rights Studies Certificates present human rights as a rich and interdisciplinary field of study. The certificates aim to provide students with the analytical, conceptual, and practical skills necessary for human rights study; connect students to affiliate faculty and peers; and offer guidance for post-graduate careers and studies related to human rights.

Students seeking to engage with Human Rights Studies can pursue one of *two pathways* alongside their major: the Intensive Human Rights Certificate, which is capped and requires an application, or the uncapped Human Rights Certificate, which offers an individualized pathway to develop expertise through related coursework. Students may choose either one, but not both of these pathways.

- To apply for the Intensive Human Rights Certificate, see the Human Rights website.
- To pursue the Human Rights Certificate, go to *Declare Major, Concentration within the Major, Certificate* on Yale Hub.

No more than two course credits fulfilling the requirements of either of the Human Rights Studies certificates may overlap with a major, a simultaneous degree, or another certificate. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major.

INTENSIVE CERTIFICATE IN HUMAN RIGHTS

This certificate accepts students by application during the spring term of their sophomore year.

REQUIREMENTS

See Links to the attributes indicating courses approved for the certificate requirements.

To fulfill the certificate requirements, students complete a gateway lecture course (HMRT 1000), five electives, and participate in a non-credited senior colloquium. The gateway course equips students with the theoretical tools necessary for studying human rights, their evolution, and their justification. It introduces several contemporary issues such as gender disparities, racial discrimination, climate change, global health, human trafficking, refugees, world poverty, and humanitarian intervention.

Elective courses The number of courses at Yale College that touch on human rights is large, and we encourage a diversity of perspectives and methodologies across departments and disciplines. The formal criterion for a program elective is that a course "engage with the language, ideas, and methods of human rights." The elective should have a substantial focus on Human Rights issues, with four or more of the thirteen (or six to eight of the twenty-six) course meetings focusing on these issues (per the syllabus). Approved electives are divided into two categories: (1) Domestic and

(2) International, and students are expected to take at least one course in each of the categories. Graduate and professional school courses may count, with approval from the certificate director(s) or if tagged with one of the attributes listed below.

Credit/D/Fail No courses taken Credit/D/Fail may be applied toward the requirements of the certificate.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the certificate requirements with the approval of the certificate director(s). An on-topic summer internship can replace one elective, again with the approval of the certificate director(s).

Additional information is available on the Human Rights program website.

SUMMARY OF REQUIREMENTS

Number of courses 6 course credits

Specific courses required HMRT 1000

Distribution of courses at least 1 course credit in each of two area categories: (1) domestic (2) international for a total of 5 electives

Other requirements non-credited senior colloquium

CERTIFICATE IN HUMAN RIGHTS

See Links to the attributes indicating courses approved for the certificate requirements.

This certificate, available to all interested Yale Students, provides the opportunity for students to pursue an interdisciplinary study of human rights.

To earn the certificate, students must take the gateway course, HMRT 1000, and 4 electives, with at least one elective chosen from each of the two area categories: (1) Domestic and (2) International. Graduate and professional school courses may count, with approval from the certificate director(s) or if tagged with one of the attributes listed below.

Credit/D/Fail No courses taken Credit/D/Fail may be applied toward the requirements of the certificate.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the certificate requirements with the approval of the certificate director(s). An on-topic summer internship can replace one elective, again with the approval of the certificate director(s).

Additional information is available on the Human Rights program website.

DECLARATION OF CANDIDACY

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Number of courses 5 course credits

Specific course required HMRT 1000

Distribution of courses 4 electives with at least 1 from each of the 2 area categories

Humanities

Director of undergraduate studies: Paul Grimstad, (paul.grimstad@yale.edu) HQ, 320 York St.

The undergraduate program in Humanities offers both interdisciplinary breadth and intellectual depth, providing students the opportunity to integrate courses from across the humanistic disciplines into personally meaningful courses of study. Works of literature, music, history, philosophy, and the visual arts are brought into conversation with one another and with the history of ideas.

The major in Humanities asks students to begin with broad surveys of foundational works in at least two different cultural traditions, including at least one course on classical Western European texts. All majors take two specially commissioned core seminars, one on the question of what "modernity" is, another spending a whole term interpreting a single work (or small corpus of works) in great depth. Students then devise an area of focus according to their interests and with the help of appropriate faculty members.

COURSES FOR NONMAJORS

Students in all classes can find options in the varied course offerings, from special seminars for first-year students to the Franke and Shulman Seminars for seniors. Many courses are open to nonmajors.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2025–2026, may be fulfilled by students who declared the major in a prior term.

See Links to the attributes indicating courses approved for the Humanities major requirements.

Fourteen term courses are required for the major, six core courses; one course in each of four areas of study in the humanities (which may include the Franke Seminar); three additional electives selected to complement the student's area of focus and approved by the director of undergraduate studies (DUS), and a one- or two-term senior essay. Majors are also required to keep an intellectual journal and are strongly encouraged to enroll in at least one term course in literature in a foreign language.

Core courses The major requires six core courses, two seminars in "Interpretations," two seminars in "Modernities" and two lectures or seminars in "Traditions." Interpretations and Modernities seminars are typically taught by a pair of faculty members from complementary disciplines. The two broad themes of the seminars remain consistent from year to year, but the material studied and the faculty members teaching change, allowing each class of students to explore the themes in different ways. The Traditions core courses focus on foundational works. No more than four of the six core courses may concern one world-historical tradition, broadly conceived.

Areas of study in the humanities One course is required in each of four areas: literature; visual, musical, or dramatic arts; science in the humanities; and intellectual

history and historical analysis. Courses may be drawn from any department or program in Yale College, with the approval of the DUS.

Intellectual journal Students are encouraged to log entries outlining particularly striking moments in their intellectual lives, whether in courses or outside of them, and to keep track of questions they would like to pursue in their studies, including possible senior essay topics. Students submit a minimum of one journal entry each semester to the DUS.

Credit/D/Fail No more than two courses taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

A one- or two-term senior essay is required (HUMS 4910).

ADVISING

Students are expected to declare their intent to major in Humanities in a meeting with the DUS before their junior year.

UNIQUE TO THE MAJOR

The Franke Seminar Sponsored by the Whitney Humanities Center and designed to speak across disciplinary lines to broad public and intellectual issues, the Franke Seminar includes a series of coordinated public lectures. The seminars are for enrolled students; the lecture series is open to the Yale and local communities. Humanities majors may enroll in a Franke Seminar with permission of the DUS and the instructor.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 14 term courses (incl senior essay)

Distribution of courses 6 core courses, as specified; 1 course in each of 4 areas of student as specified; 3 electives in area of focus

Senior requirement Senior essay (HUMS 4910)

Intellectual journal A minimum of one journal entry every term

FACULTY ASSOCIATED WITH THE PROGRAM OF HUMANITIES

Professors Jeffrey Alexander (*Sociology*), R. Howard Bloch (*French*), Edyta Bojanowska (*Slavic Languages and Literatures*), Leslie Brisman (*English*), David Bromwich (*English*), Ardis Butterfield (*English*), Rüdiger Campe (*German*), Francesco Casetti (*Humanities*), Deborah Coen (*History of Science, Medicine, and Public Health, History*), Stephen Davis (*Religious Studies, History*), Carolyn Dean (*History, French*), Carlos Eire (*History, Religious Studies*), Paul Freedman (*History*), Kirk Freudenburg (*Classics*), Bryan Garsten (*Political Science*), Marie-Hélène Girard (*French*), Emily Greenwood (*Classics*), Frank Griffel (*Religious Studies*), Martin Hägglund (*Comparative Literature, Humanities*), Christine Hayes (*Religious Studies, Judaic Studies*), Alice Kaplan (*French*), Jonathan Kramnick (*English*), Anthony Kronman (*School of Law*), Tina Lu (*East Asian Languages*

and Literatures), Ivan Marcus (*History, Religious Studies*), Stefanie Markovits (*English*), Giuseppe Mazzotta (*Italian*), Samuel Moyn (*History, School of Law*), Robert Nelson (*History of Art*), Paul North (*German*), John Durham Peters (*English, Film & Media Studies*), Brigitte Peucker (*German*), Pierre Saint-Amand (*French*), Maurice Samuels (*French*), Steven Smith (*Political Science, Philosophy*), Nicola Suthor (*History of Art*), Gary Tomlinson (*Music, Humanities*), Shawkat Toorawa (*Near Eastern Languages and Civilizations*), Katie Trumpener (*Comparative Literature*), Jing Tsu (*East Asian Languages and Literatures*), Miroslav Volf (*Divinity School*), Kirk Wetters (*German*), Christian Wiman (*Institute of Sacred Music*), Ruth Yeazell (*English*)

Associate Professors Marisa Bass (*History of Art*), Paola Bertucci (*History, History of Science, Medicine, and Public Health*), Molly Brunson (*Slavic Languages and Literatures*), Robyn Creswell (*Comparative Literature*), Toni Dorfman (*Adjunct*) (*Theater Studies*), Emily Erikson (*Sociology*), Marta Figlerowicz (*Comparative Literature, English*), Moira Fradinger (*Comparative Literature*), Milette Gaifman (*History of Art, Classics*), Mick Hunter (*East Asian Languages and Literatures*), Jacqueline Jung (*History of Art*), Brian Kane (*Music*), Noreen Khawaja (*Religious Studies*), Pauline LeVen (*Classics*), Isaac Nakhimovsky (*History*), Joseph North (English), Joanna Radin (*History of Science, Medicine, and Public Health, History*), Ayesha Ramachandran (*Comparative Literature*), Marci Shore (*History*)

Assistant Professors Lucas Bender (*East Asian Languages and Literatures, Humanities*), Marijeta Bozovic (*Slavic Languages and Literatures*), Thomas C. Connolly (*French*), Jessica Lamont (*Classics*), Giulia Oskian (*Political Science*), Jessica Peritz (*Music*), Christiana Purdy Moudarres (*Italian*), Maryam Sanjabi (*French*), Katrin Truestedt (*German*)

Senior Lecturers Peter Cole (*Judaic Studies*), William Klein (*Humanities*), Pauline Lin (*East Asian Languages and Literatures*), Stuart Semmel (*History, Humanities*), Kathryn Slanski (*Humanities, Near Eastern Languages and Civilizations*), Norma Thompson (*Humanities*)

Lecturers Benjamin Barasch (*Humanities*), Brianne Bilsky (*Humanities*), Dane Collins, Matthew Croasmun *(Divinity School*), Joseph Gordon (*English*), Paul Grimstad (*Humanities),* Alfred Guy (*English*), Katja Lindskog (*English*), Ryan McAnnally-Linz *(Divinity School*), Terence Renaud (*Humanities*), Karin Roffman (*Humanities, English*), Daniel Schillinger (*Humanities*), George Syrimis (*Hellenic Studies*), Adam Van Doren (*School of Art*)

Senior Lector Constantine Muravnik (*Slavic Languages and Literatures*)

Lector Simona Lorenzini (*Italian*)

Islamic Studies Certificate

Certificate director: Shawkat M. Toorawa (shawkat.toorawa@yale.edu)

This Certificate encompasses the study of Muslim and Islamic artistic, cultural, historical, intellectual, linguistic, literary, philosophical, political, religious, sociological and scientific presence, and impact on human society over the past one and a half millennia. It helps Yale College students curate their courses relating to Muslims and to Islam. It will be of interest to non-humanities majors with a strong interest in Islamic Studies; social science and humanities majors wishing to complement their existing interests with coursework in Islamic Studies; and self-identifying Muslim students for whom such a certificate offers an ideal way academically to explore their heritage.

REQUIREMENTS

See Links to the attributes indicating courses approved for the certificate requirements.

Students must successfully complete five course credits, of which no more than two may represent the same area of study. Currently, the four areas of study are Islamic Art, Architecture, Literature; Islamic History; Islamic Religion; and Islamic Society. Students must take one course in each of the four areas of study and the fifth course may be selected from any of the four content areas. Courses are drawn from a list of approved courses. The list is posted each semester on the Islamic Studies Certificate website. Other courses may be approved by permission of the certificate director. In addition to the course requirements, each student must attend three lectures on topics relating to Islamic Studies and submit a brief write-up. Notice of these events can be found on the Islamic Studies Certificate website.

Graduate and professional school courses may count toward the certificate; language courses and non-Yale courses may not count toward the Certificate.

No more than two course credits fulfilling the requirements of the Islamic Studies certificate may overlap with a major, a simultaneous degree, or another certificate. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major. All courses must be taken for a letter grade, and students must achieve a grade of C or above.

Credit/D/Fail No courses taken Credit/D/Fail may be applied toward the requirements of the certificate.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with prior DUS approval.

DECLARATION OF CANDIDACY

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Number of courses 5 course credits

Distribution of courses 1 course in each of the four content areas; 1 elective from any of the four content areas

Additional requirements attendance of 3 Islamic Studies lectures, and submission of a 1–2 page write-up for each

Italian Studies

Director of undergraduate studies: Simona Lorenzini (simona.lorenzini@yale.edu), 320 York St., 432-0508; language program director: Anna Iacovella (anna.iacovella@yale.edu), 320 York St., 432-8299; italian.yale.edu

The major in Italian Studies explores Italy's vital role in the formation of Western thought and culture. The core language courses provide students with the opportunity to acquire an in-depth linguistic proficiency, together with a solid literary and historical background in the language. In its interdisciplinary focus, the major offers a variety of advanced courses in literature, cinema, history, translation practice, art, and gender studies. Central to the major is the conviction that delving into another language and culture, in addition to the intellectual enrichment it affords, raises students' awareness of what is distinctive about their own cultural identity.

Italian makes an excellent second major as a complement to several extradepartmental disciplines, among them History of Art, Comparative Literature, Economics, Film and Media Studies, History, Political Science, and Architecture.

Studying and appreciating a foreign language, literature, and culture offers students a useful and challenging option in their university education. In particular, the Italian Studies major prepares students for careers in international business, translation, journalism, economics, art, media, film, fashion, design, education, and tourism.

PREREQUISITE

Candidates for the major should have completed a course in Italian at the level of ITAL 1300 (L3) or should have received credit for equivalent work by the end of their sophomore year. Exceptions may be made in the case of outstanding students who have not satisfied this requirement.

PLACEMENT PROCEDURES

All students who have not taken Italian at Yale are expected to take the departmental placement test, except for students who have no previous knowledge of Italian. The placement examination is completed online during the summer; see the *Calendar for the Opening Days of College* and the department website for details.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the major requirements.

The major consists of eleven term courses beyond the prerequisite. Eight term courses in the Italian Studies department numbered 1400 or above (including graduate courses) are required, at least five of which must be conducted in Italian. The courses in the department must include ITAL 1400 or equivalent, either ITAL 1500 or 1510, a survey course on Italian literature (ITAL 4162 or 4172), and a course on Dante's *Divine Comedy* (ITAL 1310 or equivalent). The aim of these foundational courses is to provide students with both a broad acquaintance with the major works of Italian Studies and a more detailed knowledge of specific periods in Italian literature and media. No more than three Italian department courses taught in English may count toward the major. Students intending to major in Italian Studies should consult the director of undergraduate studies (DUS).

In completing their programs, students are required to elect two courses in other languages and literatures, history of art, history, linguistics, philosophy, or media that are related to their field of study and approved by the DUS. Any graduate course in another national literature or in linguistics may be substituted for one of these two courses.

Credit/D/Fail No more than one course taken Credit/D/Fail may be counted toward the major requirements (excluding the senior essay requirement).

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

During their senior year, all students majoring in Italian Studies are required to meet with the DUS at least twice per month. In the fall or spring of the senior year, all majors must present a departmental essay written in Italian and completed under the direction of a faculty adviser in ITAL 4491. The essay should demonstrate careful reading and research on a topic approved by the adviser in consultation with the DUS. A recommended length for the essay is thirty pages, plus bibliography. The student and the advisor will select and invite a second faculty reader, who will receive the final version of the thesis by the established deadline. While prospectus and draft deadlines are determined by the adviser, the student must submit the final version no later than 10 days before the last day of classes, in the Fall or Spring. The senior requirement culminates in a meeting with department faculty to discuss the thesis and the student's overall experience of study in the major.

ADVISING

The department's course offerings vary greatly from year to year. Students interested in planning coursework in Italian that extends beyond the current academic year should consult the DUS.

Related majors In addition to the major in Italian Studies, the department supports the applications of qualified students who wish to pursue a course in Italian studies under the provisions of a Special Divisional Major. Majors can devise a broad program in social, political, economic, or intellectual history as related to and reflected in Italian literature, or pursue special interests in architecture, film, art, philosophy, music, history, linguistics, theater, political theory, or other fields especially well-suited for examination from the perspective of Italian cultural history. Majors in Italian Studies must design their programs in close consultation with the DUS and seek the guidance of an additional member of the department whose interests closely coincide with the proposed program of study. For further information, see Special Divisional Majors.

Combined B.A./M.A. degree program Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in Italian.

STUDY ABROAD

For information about the Year or Term Abroad program, see Academic Regulations, section K, Special Academic Programs, "Year or Term Abroad."

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite ITAL 1300 or equivalent

Number of courses 11 term courses beyond prereq (incl senior req)

Specific courses required ITAL 1400 or equivalent; ITAL 1500 or 1510; ITAL 4162 or 4172; ITAL 1310 or equivalent

Distribution of courses 8 term courses in Italian Studies dept numbered 1400 or above, at least 5 of these conducted in Italian; 2 elective courses in other langs and lits, hist of art, hist, ling, phil, or media approved by DUS

Substitution permitted One grad course in another national literature or in linguistics, with DUS permission

Senior requirement Senior essay in Italian (ITAL 4491) and a meeting with departmental faculty members at the end of the final semester

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The Italian Department offers a Certificate of Advanced Language Study in Italian. A certificate adviser, typically the director of undergraduate studies (DUS), advises students on the certification process. The student's official transcript lists the Certificate of Advanced Language Study.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in Italian, at least three of which must be Yale courses designated as L5. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the certificate adviser, one advanced non-L5 course, conducted in Italian, such as an independent study course (graded pass/fail), a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course taught in English to count toward the certification requirements provided the course includes at minimum a weekly discussion section conducted entirely in Italian. The discussion section must enroll a minimum of three students and the course must be designated as LxC in the course description.

The adviser may also approve the substitution of up to two credits earned during study abroad and taught in Italian to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure that those courses appear on their transcripts.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy
Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY OF THE DEPARTMENT OF ITALIAN

Professors Millicent Marcus, Jane Tylus (*Chair*), Heather Webb

Assistant Professors Serena Bassi, Alessandro Giammei

Senior Lecturer Pierpaolo Antonello

Senior Lector II Anna Iacovella

Senior Lectors Michael Farina, Simona Lorenzini, Deborah Pellegrino

Professor in the Practice Amara Lakhous

Affiliated Faculty Paola Bertucci (*History of Science, Medicine, and Public Health*), Howard Bloch (*French*), Jessica Brantley (*English*), Francesco Casetti (*Film and Media Studies*), Joanna Fiduccia (*History of Art*), Jacqueline Jung (*History of Art*), Laurence Kanter (*Yale University Art Gallery*), Gundula Kreuzer (*Music*), Morgan Ng (*History of Art*), Jessica Peritz (*Music*), David Quint (*English and Comparative Literature*), Ayesha Ramachandran (*Comparative Literature*), Kevin Repp (*Beinecke Library Curator, Modern European Books and Manuscripts*), Lucia Rubinelli (*Political Science*), Pierre Saint-Amand (*French*), Gary Tomlinson (*Music*)

Jewish Studies

Director of undergraduate studies: Hannan Hever (hannan.hever@yale.edu); HQ 341; hannan.hever@yale.edu

Jewish Studies enables students to develop a broad knowledge of the history, religion, literature, philosophy, languages, and politics of the Jews. Jewish society, texts, ideologies, material cultures, and institutions are studied from a comparative perspective in the context of histories, cultures, and intellectual traditions among which Jews have lived throughout the ages. As an interdisciplinary program, Jewish Studies employs historical, literary, political, social, and philosophical methods of analysis.

The Jewish Studies major—especially as a second major with Economics, Political Science, Comparative Literature, English, Philosophy, or History—offers a broad liberal arts background combined with intensive preparation in the historical and religious experience of Jewish culture from antiquity to contemporary times. The major epochs of Jewish history are the Persian and Hellenistic, classical, medieval, early modern, and modern periods.

Students considering a major in Jewish Studies should contact the director of undergraduate studies (DUS) as early as possible.

REQUIREMENTS OF THE MAJOR

The major in Jewish Studies requires thirteen term courses, including three courses selected from a set of core requirements, a language or literature requirement, three courses selected from each of two areas of focus, and the senior requirement.

Core requirements Each student must elect at least three from the following: (1) a course in Hebrew Bible, such as JDST 1000; (2) a course in rabbinic literature or ancient Judaism, such as JDST 3035; (3) JDST 2000; (4) JDST 2001; (5) a course in Jewish thought, such as JDST 3681 or JDST 3693; (6) a survey course in Hebrew and Jewish literature.

Language or literature requirements Students must complete either HEBR 1100 and 1200 or two courses in Hebrew literature in translation. Up to three Hebrew language courses may be counted toward the requirements of the major.

Areas of focus Students must select two of the following focus areas: ancient Israel/Hebrew Bible; Judaism and Jewish history of Second Temple and Talmudic times; Jewish history and civilization of medieval and Renaissance times; modern Jewish history and civilization; Jewish/Hebrew literature (which requires the study of literature in Hebrew); and Jewish thought. With the approval of the DUS, students may design their own areas of focus.

In each of the two areas of focus, students choose three courses in consultation with the DUS. These are expected to comprise one introductory course; one seminar taken in the junior year, and one course requiring a final research paper. One relevant course should be in an area outside Jewish Studies, such as a course relating to the larger historical, literary, or philosophical context if the focus area is in a historical period, or a course in the theory or practice of literature if the focus area is in Jewish/Hebrew literature.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the major requirements.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students are required either to complete a two-term senior essay in JDST 4491 and JDST 4492 related to both areas of focus or to complete a one-term senior essay in JDST 4491 or JDST 4492 related to one area of focus and an additional seminar related to the other. The senior essay may build on research conducted for one or both of the student's junior seminar papers.

STUDY ABROAD

Students majoring in Jewish Studies should be aware of the numerous opportunities for study abroad. Those interested in research and language-study opportunities in the Middle East, Europe, and South America should consult the DUS.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 13 term courses (incl senior req)

Distribution of courses 3 core courses as indicated; HEBR 1100 and 1200, or 2 courses in Hebrew lit in translation; 2 areas of focus, with 3 courses in each for a total of 6 focus area courses

Senior requirement Two-term senior essay (JDST 4491, JDST 4492) or one-term senior essay (JDST 4491 or JDST 4492) and additional seminar

FACULTY ASSOCIATED WITH THE PROGRAM OF JUDAIC STUDIES

Professors Joel Baden (*Divinity School*), Leslie Brisman (*English*), Paul Franks (*Philosophy*), Hannan Hever (*Comparative Literature*), Sarit Kattan (*Religious Studies)*, Nancy Levene (*Religious Studies*), Ivan Marcus (*History, Religious Studies*), Samuel Moyn (*Law*), Edieal Pinker (*School of Management*), Maurice Samuels (*French*), Steven Smith (*Political Science, Philosophy*), David Sorkin (*History*), Elli Stern (*Chair*)(*Religious Studies*), Katie Trumpener (*Comparative Literature, English*), Jacqueline Vayntrub (*Religious Studies*), Laura Wexler (*Women's, Gender, & Sexuality Studies, American Studies*), Molly Zahn (*Religious Studies*)

Associate Professor Marci Shore (*History*)

Senior Lecturer Peter Cole (*Comparative Literature*)

Lecturer Margaret Olin (*Emeritus/Divinity School, History of Art, Religious Studies*)

Senior Lector II Shiri Goren

Senior Lectors Dina Roginsky, Orit Yeret

Lector Joshua Price

Latin American Studies

Director of undergraduate studies: Ana De La O (ana.delao@yale.edu), Room 327, 115 Prospect St.; (203) 432-5234; https://macmillan.yale.edu/academic-programs

The major in Latin American Studies is designed to further understanding of the societies and cultures of Latin America as viewed from regional and global perspectives. The Latin American Studies major builds on a foundation of language and literature, history, history of art, theater studies, humanities, and the social sciences; its faculty is drawn from many departments and professional schools of the University.

The major in Latin American Studies is interdisciplinary. With two goals in mind—intellectual coherence and individual growth—the student proposes a course of study that must satisfy the requirements listed below. The proposed course of study must be approved by the director of undergraduate studies (DUS). Though all students choose courses in both the humanities and the social sciences, they are expected to concentrate on one or the other.

Students are held to the prerequisite and major requirements that were in place when they declared their major. However, with approval from the director of undergraduate studies (DUS), the following requirements, updated in the academic year 2024–2025, may be fulfilled by students who declared the major in a prior term.

PREREQUISITES

Prerequisite to declaring the major is knowledge of either Spanish or Portuguese at the L3 level. Equivalent placement determined by the placement examination also fulfills the prerequisite.

REQUIREMENTS OF THE MAJOR

The major itself requires twelve term courses: one introductory course approved by the DUS; seven courses related to Latin America from departmental offerings; three additional electives; and the senior essay LAST 4491 or senior project LAST 4492. One of the twelve courses must be taught in Spanish or Portuguese at the L5 level.

The seven Latin American content courses should include courses from the following categories: two courses in the social sciences (anthropology, economics, or political science); two courses in history; two courses in Spanish American or Brazilian literatures beyond the language requirement; one course in art, architecture, film and media studies, music, or theater studies. Students wishing to count toward the major courses that do not appear in the program's course offerings, but have at least a third of syllabus' material related to the region, should consult with the DUS.

Students must enroll in three seminars or upper-level courses during their junior and senior years. Elective seminars must be approved by the DUS.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the major requirements.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The senior requirement is a research paper written usually in one term in LAST 4491 or a senior project in LAST 4492.

For the senior essay, students choose their own topics, which may derive from research done in an earlier course. The essay is planned in advance in consultation with a qualified adviser and a second reader. In preparing the senior essay, Latin American Studies majors may undertake field research in Latin America. Students are encouraged to apply for summer travel grants through the Council on Latin American and Iberian Studies to conduct field research for their senior thesis. The Albert Bildner Travel Prize is awarded to an outstanding junior who submits an application in Spanish or Portuguese in addition to the English application essay. Information about these and other grants is available on Yale's Student Grants & Fellowships website.

For the senior project, students formulate and execute a project under the supervision of a faculty adviser in the fall or spring term. Students work on projects of their own choice. Proposals for senior projects are submitted to the adviser and the director of undergraduate studies by the end of the term preceding the last resident term. An interim project review takes place by the fifth week of the term the project is developed. Permission to complete the senior project can be withdrawn if satisfactory progress has not been made. An exhibition of selected work done in the project is expected of each student.

ADVISING

A list of courses intended as a guide to students in preparing their programs is available at the office of the DUS and on the Council on Latin American and Iberian Studies website. Qualified students may also elect pertinent courses in the Graduate School and in some of the professional schools with permission of the director of graduate studies or professional school registrar and the DUS.

STUDY ABROAD

Students are strongly encouraged to take advantage of study abroad opportunities during summers or through the Year or Term Abroad program. For more information, see Academic Regulations, section K, Special Academic Programs, "Year or Term Abroad."

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites Spanish or Portuguese at L3 level or higher; or equivalent score on placement exam

Number of courses 12 courses beyond prereqs (incl senior requirement)

Distribution of courses 1 intro course; 7 courses with Latin American content in specified fields as indicated; 3 addtl electives; 3 of the courses must be seminars or upper-level courses taken in junior and senior years; 1 of the courses must be taught in Spanish or Portuguese at L5 level; all approved by DUS

Senior requirement Senior essay (LAST 4491) or senior project (LAST 4492)

FACULTY ASSOCIATED WITH THE PROGRAM OF LATIN AMERICAN STUDIES

Professors Rolena Adorno (*Spanish & Portuguese*), Ned Blackhawk (*History, American Studies*), Richard Burger (*Anthropology*), Hazel Carby (*African American Studies,*

American Studies), Carlos Eire (*History, Religious Studies*), Eduardo Fernandez-Duque (*Anthropology*), Paul Freedman (*History*), Aníbal González (*Spanish & Portuguese*), Roberto González Echevarría (*Spanish & Portuguese*), K. David Jackson (*Spanish & Portuguese*), Gilbert Joseph (*History*), Stathis Kalyvas (*Political Science*), Daniel Markovits (*Law School*), Mary Miller (*History of Art*), Stephen Pitti (*History*), Susan Rose-Ackerman (*Law School, Political Science*), Alicia Schmidt Camacho (*American Studies*), Stuart Schwartz (*History*), Susan Stokes (*Political Science*), Robert Thompson (*History of Art*), Noël Valis (*Spanish & Portuguese*), Frederick Wherry (*Sociology*), Elisabeth Wood (*Political Science*)

Associate Professors Robert Bailis (*Forestry & Environmental Studies*), Susan Byrne (*Spanish & Portuguese*), Rodrigo Canales (*School of Management*), Ana De La O (*Political Science*), Moira Fradinger (*Comparative Literature*)

Assistant Professors Vanessa Agard-Jones (*Women's, Gender, & Sexuality Studies*), Ryan Bennett (*Linguistics*), Oswaldo Chinchilla (*Anthropology*), Marcela Echeverri (*History*), Anne Eller (*History*), Leslie Harkema (*Spanish & Portuguese*), Seth Jacobowitz (*East Asian Languages & Literatures*), Erica James (*History of Art, African American Studies*), Albert Laguna (*American Studies, Ethnicity, Race, & Migration*), Dixa Ramirez (*American Studies, Ethnicity, Race, & Migration*)

Senior Lectors II Margherita Tortora, Sonia Valle

Senior Lectors Sybil Alexandrov, Marta Almeida, María Pilar Asensio-Manrique, Mercedes Carreras, Ame Cividanes, Sebastián Díaz, María de la Paz García, María Jordán, Rosamaría León, Juliana Ramos-Ruano, Lissette Reymundi, Lourdes Sabé-Colom, Bárbara Safille, Terry Seymour

Lector Selma Vital

Linguistics

Director of undergraduate studies: Jason Shaw (jason.shaw@yale.edu); ling.yale.edu

Linguistics is the systematic study of human language. Linguistics studies how language works: how it is produced and processed in the mind, how it develops in children, how it is used in society, and how it changes over time. Linguistics also looks at the structures of the thousands of spoken and signed languages used throughout the world. The undergraduate major in Linguistics introduces students to many of the key areas of linguistics and offers a program of study leading toward an understanding of phonological, grammatical, and semantic structure and various approaches to descriptive, experimental, computational, and historical linguistics. Majors take a flexible combination of courses across subfields of linguistics and go into depth in one or more areas. Students learn about the many ways that language interfaces with questions in the social sciences, humanities, and sciences, and they often take complementary coursework in other departments or programs. All students write a senior essay and many make use of their linguistics work in future careers. Interested students should consult the director of undergraduate studies (DUS).

COURSES FOR NONMAJORS AND MAJORS

Students with no previous background in linguistics are encouraged to approach the field by taking a 1000-level course. All 1000-level courses are accessible to students with no prior background.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Linguistics major requirements.

The major requires twelve term courses in linguistics and related areas, distributed as follows:

1. Breadth requirement (four courses). All majors must take one course in the areas of phonology (LING 2320) and syntax (LING 2530). In addition, at least one course must be taken in any two of the six remaining foundational areas of linguistics: phonetics, morphology, semantics/pragmatics, computational linguistics, language and mind/brain, and historical linguistics.
2. Depth requirement (two courses). In one of the eight areas of linguistics, students must take two additional courses beyond the introductory level.
3. Electives (four courses). Four additional courses relating to linguistics are required, at least one of which must be at the 2000 level or above. Electives may be chosen from courses offered by the Linguistics department or, with approval of the DUS, from related courses in programs such as Anthropology, Classics, Cognitive Science, Computer Science, English, Philosophy, Psychology, or foreign languages. No more than two foreign language courses can count toward the major without specific DUS approval.
4. Senior research requirement (one course). LING 4900, Research Methods in Linguistics, is required and is typically taken in the fall term for those students graduating in the spring. Students graduating in the fall may take it in the fall term of their junior year. This course prepares students for the senior essay.

Credit/D/Fail No courses taken Credit/D/Fail, Pass/Fail, or any scale other than the standard letter-grade scale, may be applied toward the requirements of the major without specific DUS approval.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Senior requirement (one course). Students attend a research colloquium and write a senior essay in LING 4910 during the final spring term of the senior year.

ADVISING

Combined B.A./M.A. degree program Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in Linguistics.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific courses required LING 2320 (phonology), LING 2530 (syntax), LING 4900

Distribution of courses 1 course each in 2 foundational areas other than phonology and syntax (breadth req), as specified; 2 addtl courses beyond intro level in 1 foundational area (depth req); 4 electives, at least 1 at the 2000 level or above

Substitution permitted Electives from related programs with DUS approval

Senior requirement LING 4910

FACULTY OF THE DEPARTMENT OF LINGUISTICS

Professors Claire Bowern, Veneeta Dayal, Robert Frank, Laurence Horn (*Emeritus*), †Frank Keil, †Joshua Knobe, Maria Piñango, Fernando Rubio (*Adjunct*), †Jason Stanley, †Zoltán Szabó, Raffaella Zanuttini (*Chair*)

Associate Professors Athulya Aravind, Simon Charlow, Jason Shaw, Jim Wood

Assistant Professors Tom McCoy, Augustina Owusu (*Visiting*), Natalie Weber

Lector Julia Silvestri

Lecturer Lydia Newkirk

†A joint appointment with primary affiliation in another department.

Mathematics

See also Applied Mathematics

Directors of undergraduate studies: Richard Kenyon [spring 2025], Sebastian Hurtado-Salazar [fall 2025 and spring 2026], Miki Havlickova [all semesters]; contact email: math.dus@yale.edu; Math DUS website; Math department website

Mathematics has many aspects: it is the language and tool of the sciences, a cultural phenomenon with a rich historical tradition, and a model of abstract reasoning. The course offerings and the major in Mathematics reflect these multiple facets. The Mathematics major provides a broad education in various areas of mathematics in a program flexible enough to accommodate many ranges of interest. Incoming students are encouraged to visit the Math first-year student resources website for advice about choosing their mathematics courses.

PREREQUISITE

The prerequisite for both the B.A and B.S. degree programs is single variable calculus, through the level of MATH 1150 or equivalent (such as a score of 4 or 5 on the AP Calculus BC exam).

CALCULUS PLACEMENT PROCEDURES

The department offers a three-term sequence in calculus, MATH 1120, 1150, and 1200. Students who have not taken calculus at Yale and wish to enroll in calculus must take the mathematics online placement examination. Detailed information is available on the Math first-year student resources website. A calculus advising session will be held prior to registration to answer student questions about placement.

MATH 1120 covers differential calculus and assumes mastery of high school algebra, geometry, and trigonometry. Enrolling students are expected to know the basic definitions of trigonometric functions, inverse functions, factoring quadratic polynomials, and elementary area and volume formulas of plane and solid geometry. Students who could benefit from a review of precalculus are encouraged to consider MATH 1100 and 1110 in place of MATH 1120.

The next course in the calculus sequence is MATH 1150, which covers integral calculus, including sequences and series. It assumes mastery of the content of MATH 1120 or equivalent (AP Calculus AB exam).

MATH 1200 covers multivariable calculus and assumes mastery of the material in MATH 1150 or equivalent (AP Calculus BC exam).

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for Math major requirements.

Students are held to the requirements that were in place when they declared their major. However, with approval from the director of undergraduate studies (DUS), the following requirements, updated for the academic year 2024-2025, may be fulfilled by students who declared the major in a prior term.

Introductory sequence requirement Each student is expected to complete Linear algebra with proofs (MATH 2250 or 2260), Real analysis (MATH 2550 or 2560), and Vector analysis or Multivariable calculus (MATH 3020 or 1200).

B.A. degree program The B.A. degree program consists of ten term courses in Mathematics numbered 2250 or higher, including the senior requirement, but excluding MATH 4700. To acquire both depth and breadth in the field, students are required to take at least three courses that carry the "math distribution" attribute (YC MATH Distribution), searchable in Yale Course Search (YCS). Students are also required to complete MATH 3500 (algebra), and at least one of MATH 3050 (real analysis) or MATH 3100 (complex analysis). Taking all three is recommended. With prior written permission from the DUS, students familiar with the material may substitute a higher-level course in the same area (typically MATH 3700, 3200, 3150 respectively.)

B.S. degree program The B.S. degree program consists of twelve term courses and follows the same requirements as for the B.A. degree, with the addition of at least two advanced term courses in the physical sciences, such as ASTR 4180, ASTR 4300, CHEM 3330, 4700, PHYS 4010 or PHYS 4100, PHYS 4020 or PHYS 4300, PHYS 4400, PHYS 4410, PHYS 4500. Other such courses require the approval of the director of undergraduate studies (DUS); written approval is advised.

Distinction in the major To be eligible for Distinction in the Major, a student must have completed MATH 3050 (real analysis), MATH 3100 (complex analysis), and MATH 3500 (algebra).

The intensive major Candidates for a degree with an intensive major in Mathematics must take MATH 3050, 3100, and 3500. Intensive majors are also expected to include at least two graduate courses level 5000 or above in the Mathematics department, or equivalent independent study, among their required ten mathematics courses. Familiarity with the material of the following courses is prerequisite to graduate courses in each category: *algebra:* MATH 3500 and MATH 3700; *analysis:* MATH 3050, 3100; *algebraic topology:* MATH 3500, 4300.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken after matriculation at Yale at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

During the senior year, students majoring in Mathematics fulfill the senior requirement by taking any Math course numbered MATH 4800 through MATH 4890. Alternatively, with the consent of the DUS, students may write a senior essay in MATH 4750 under the guidance of a faculty member, which includes both a written and an oral report. Students wishing to write a senior essay should consult the DUS at least six weeks before enrolling in MATH 4750, and are encouraged to pursue independent study opportunities prior to their senior year, for example through the Mathematics directed reading program or through summer research programs.

ADVISING

Students interested in pursuing further study in pure mathematics should include MATH 3020, 3050, 3100, 3500, 3700, and 4300 in their programs, and should consider taking one or more graduate-level courses. Students interested in applications of mathematics should include MATH 3020, 3100, 3500, and a selection of courses from MATH 2410, 2420, 2440, 2460, 2470, 2510, 2600.

Courses related to mathematics Each Mathematics major is urged to acquire additional familiarity with the uses of mathematics by taking courses in Applied Mathematics, Computer Science, Engineering and Applied Science, Economics, Philosophy, Physics, Statistics and Data Science, or other departments. With approval from the DUS, up to two math-intensive courses from other departments may be counted among the ten courses required for the major in Mathematics.

Graduate work Each year the Mathematics department offers a large number of graduate courses, some of which are accessible to undergraduates with advanced preparation in mathematics. Graduate courses numbered 5000–5999 may be counted toward the requirements of the major.

Combined B.S./M.S. degree program Students who, by the end of their senior year, complete the requirements of the department for the M.S. in Mathematics are eligible to receive this degree at their Senior Commencement. Required are: (1) eight additional term courses numbered 5000–9999, most of which must be completed with grades of B or better; (2) passing a written qualifying examination of the student's choice from analysis, algebra, or topology.

The master's program is in no sense a substitute for the B.S. program; rather, it is designed to accommodate exceptional students who, by means of accelerated or independent study, can satisfy the department as to their command of the content of the normal undergraduate program by the end of the junior year. Candidates must contact the Mathematics DUS at least two weeks prior to the last day of classes of their fifth term at Yale College. Minimum eligibility criteria include at least seventy-five percent of A/A– grades within mathematics as well as seventy-five percent of A/A– grades overall. For more information on mathematics requirements, please see the B.S./M.S. section of the Math major FAQ. For more information on Yale College requirements for the program, see Academic Regulations, Section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees."

Graduate classes: Undergraduate students are welcome to enroll in courses level 5000 and above, after completing the relevant pre-requisites. We recommend that students wishing to take graduate classes begin with courses level 5000–5999, which are designed to be accessible to advanced undergraduates, and can be counted toward undergraduate requirements of the major. Courses level 6000 and above cannot be counted toward undergraduate requirements of the major, but they can earn graduation credit, and be applied toward the graduate requirement of the intensive mathematics major as well as toward the graduate requirement of the combined B.S./M.S. degree.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite Single-variable calculus through MATH 1150 or equivalent

Introductory sequence Linear algebra with proofs (MATH 2250 or MATH 2260), Real analysis (MATH 2550 or MATH 2560), and Vector analysis or Multivariable calculus (MATH 3020 or MATH 1200).

Number of courses *B.A.*—10 term courses numbered 2250 or higher (incl senior req), excludes MATH 4700; *B.S.*—12 term courses numbered 2250 or higher (incl senior req), excludes MATH 4700

Specific courses required *B.A. and B.S.*—MATH 3500; MATH 3050 or MATH 3100

Distribution of courses *B.A. and B.S.*— 3 courses in the Math distribution category; *B.S.*—at least two adv term courses in the physical sciences as approved by DUS

Substitution permitted With DUS permission, up to 2 math-intensive courses from other depts

Intensive major All three of MATH 3050, 3100, 3500; 2 math grad courses level 5000 through 5999 or equivalent independent study counted among the required courses

Senior requirement Senior seminar numbered MATH 4800 through 4890, or MATH 4750 with DUS permission

FACULTY OF THE DEPARTMENT OF MATHEMATICS

Professors Richard Beals (*Emeritus*), Jeffrey Brock, Andrew Casson (*Emeritus*), Ronald Coifman, Igor Frenkel, Howard Garland (*Emeritus*), Anna Gilbert, Alexander Goncharov, Roger Howe (*Emeritus*), Peter Jones, Richard Kenyon, Ivan Losev, Gregory Margulis, Yair Minsky, Vincent Moncrief, Andrew Neitzke, Hee Oh, †Nicholas Read, Vladimir Rokhlin, Wilhelm Schlag, George Seligman (*Emeritus*), †Daniel Spielman, Van Vu, Lu Wang, †John S. Wettlaufer, Gregg Zuckerman (*Emeritus*)

J. W. Gibbs Assistant Professors Yariv Aizenbud, Pablo Boixeda Alvarez, Subhadip Dey, Gurbir Dhillon, Daniel Douglas, James Farre, Abinand Gopal, Erik Orvehed Hiltunen, Yakov Kononov, Boris Landa, Or Landesberg, Kevin O'Neill, Cosmin Pohoata, Congling Qiu, Ebru Toprak, Franco Vargas Pallete

Adjunct Professors Gil Kalai, Alex Lubotzky, Jacques Peyriere, Mathias Schacht

Senior Lecturers John Hall, Miki Havlickova

Lecturers Ian Adelstein, Mihai Alboiu, James Barnes, Rachel Diethorn, Eric Geiger, Su Ji Hong, Robert McDonald, Brett Smith

†A joint appointment with primary affiliation in another department.

Mathematics and Philosophy

Directors of undergraduate studies: Sebastian Hurtado-Salazar (Mathematics), Miki Havlickova (Mathematics), Math DUS (math.dus@yale.edu); Keith DeRose (keith.derose@yale.edu)(Philosophy)

The Mathematics and Philosophy major allows students to explore those areas where philosophy and mathematics meet, in particular, mathematical and philosophical logic and the philosophy of mathematics.

PREREQUISITE

The prerequisite for the major is MATH 1200. With prior written permission from the Mathematics DUS, students who completed multivariable calculus during high school may substitute a higher level mathematics course in the same area.

REQUIREMENTS OF THE MAJOR

The major requires twelve term courses including the prerequisite and the senior seminar. Of the remaining courses, at least four must be in mathematics level 2220-4690, and five must be in philosophy. The remaining course may be either a mathematics or philosophy course. All philosophy courses are eligible for credit toward the major, except First-Order Logic (PHIL 1115). Required courses include Set Theory (MATH 2700), Mathematical Logic (PHIL 2267), Computability and Logic (PHIL 4427), an additional advanced philosophy course with a substantive logical component, (other than PHIL 4427) that fulfills the senior requirement (see below). Set Theory (MATH 2700) and Mathematical Logic (PHIL 2267) must be taken before the end of the junior year; it is strongly recommended that they be taken earlier.

A course must be listed with a MATH number to count toward the mathematics requirements—substitutions from other departments are not permitted. Graduate mathematics courses level 5000–5999 may be counted as electives; graduate mathematics courses level 6000 or above may not be counted.

SENIOR REQUIREMENT

Each year certain seminars offered by the Mathematics and Philosophy departments are designated as fulfilling the senior requirement of the combined major. If such a seminar is taken to fulfill the senior requirement, majors must consult with the instructor and agree upon additional work required. Typically, additional work includes a substantial class presentation and/or preparation of a series of drafts prior to submission of the final paper.

The mathematics seminars, numbered MATH 4800 through 4890, fulfill the senior requirement. For philosophy seminars that fulfill the senior requirement, consult the director of undergraduate studies (DUS) in Philosophy.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major (including the prerequisite), with permission of the DUSs. The following courses must be taken for letter grades: MATH 2700, PHIL 2267, PHIL 4427; the required mathematics courses level 2220 or higher; the additional philosophy course with an advanced logic component; and the senior seminar.

Outside credit Courses taken after matriculation at Yale at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

ADVISING

A typical program satisfying the major might consist of MATH 1200, MATH 2250 or MATH 2260, MATH 2700, MATH 2550, two math electives level 2220 or higher; PHIL 1126, PHIL 2267, 4427, two philosophy electives; a senior seminar in Mathematics or Philosophy.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite MATH 1200

Number of courses 12 term courses (incl prereq and senior sem)

Specific courses required MATH 2700, PHIL 2267, 4427

Distribution of courses 3 additional courses in MATH at 2220 level or higher; 3 additional courses in PHIL, incl 1 PHIL course with adv logic component; 1 math or philosophy elective

Senior requirement Senior seminar in philosophy or MATH 4800 through 4890

Mathematics and Physics

Adviser for the major: Vincent Moncrief (vincent.moncrief@yale.edu), KT 413, 432-6930

Directors of undergraduate studies: Sebastian Hurtado-Salazar (Mathematics), Miki Havlickova (Mathematics); math.dus@yale.edu; David Poland (dus.physics@yale.edu) (Physics)

The major in Mathematics and Physics allows students to explore the productive interaction between the two subjects more extensively than either individual major.

PREREQUISITES

Students are held to the prerequisites that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2025–2026, may be fulfilled by students who declared the major in a prior term.

Prerequisites to the major include MATH 1200, an introductory physics lecture sequence numbered PHYS 1800, PHYS 1810 or above, and the introductory laboratory course PHYS 2050L.

With prior written permission from the Mathematics DUS, students who completed multivariable calculus during high school may substitute a higher level mathematics course in the same area for MATH 1200. The course being substituted will not count toward the total of fourteen term courses (beyond the introductory level) required for the major.

Students who have taken the introductory physics lecture sequence PHYS 1700, PHYS 1710, or the physics laboratory sequence PHYS 1650L, PHYS 1660L, may also enter the major with permission of the Physics DUS.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2025–2026, may be fulfilled by students who declared the major in a prior term.

Beyond the prerequisites, the major requires fifteen term courses for 14.5 credits, above the introductory level, including PHYS 2060L and the senior project. At least six of these must be mathematics courses numbered 2220–4690, and at least six must be advanced physics courses (including the senior requirement) chosen in consultation with the adviser for the major. The two remaining courses may be either mathematics or physics courses.

A course must be listed with a math number to count toward the mathematics requirements, including the prerequisites—substitutions from other departments are not allowed. Graduate mathematics courses level 5000–5999 may be counted as electives; graduate mathematics courses level 6000 or above may not be counted.

SENIOR REQUIREMENT

A senior project in PHYS 4710 or PHYS 4720 on a topic appropriate for the combined major and acceptable to both the Physics and the Mathematics departments is also required.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including the prerequisites.

Outside credit Courses taken after matriculation at Yale at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

ADVISING

Graduate classes Undergraduate students are welcome to enroll in courses level 5000 and above, after completing the relevant pre-requisites. We recommend that students wishing to take graduate classes begin with courses level 5000–5999, which are designed to be accessible to advanced undergraduates, and can be counted toward undergraduate requirements of the major. Courses level 6000 and above cannot be counted toward undergraduate requirements of the major, but they can earn graduation credit, and be applied toward the graduate requirement of the intensive mathematics major as well as toward the graduate requirement of the combined B.S./M.S. degree.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites MATH 1200; PHYS 1800, PHYS 1810, or above; PHYS 2050L.

Number of courses 14.5 course credits beyond prereqs, incl senior req

Distribution of courses 6 mathematics courses numbered 2220–4690; PHYS 2060L and 6 advanced physics courses selected in consultation with major adviser; 2 math or physics electives

Senior requirement Senior project in PHYS 4710 or PHYS 4720 on topic acceptable to both depts

Mechanical Engineering

Director of undergraduate studies: Corey O'Hern (corey.ohern@yale.edu), M203 ML, 432-4258; seas.yale.edu/departments/mechanical-engineering-and-materials-science

Mechanical engineering is among the most diversified of the traditional engineering disciplines. The mechanical engineer builds machines to extend our physical and mental capabilities and to convert traditional and novel energy sources into useful forms.

The role of the mechanical engineer has changed dramatically over the past few decades with the extensive use of high-performance computers (in such areas as computational fluid dynamics, materials design, control, and manufacturing), the interfacing of microelectromechanical systems and actuators via microprocessors to build high-precision sensors and devices, and the advent of advanced materials (e.g., composites, shape-memory alloys, ceramics, and superconductors) for new applications (e.g., coatings, biomaterials, and computer storage). These areas offer mechanical engineering students special opportunities for creativity, demanding that they learn not only in depth but also in breadth. Demands for increased energy efficiency and reduced environmental impact—as might be realized, for example, in novel gas turbine or electric hybrid vehicles—require that students understand the fundamentals of mechanics, thermodynamics, fluid mechanics, combustion, and materials science. In all these tasks, the utmost consideration of the modern mechanical engineer is improving the quality of human life. The engineer must also be constantly aware both of the finiteness of Earth's resources and its environment and of the burden that engineering places on them.

The educational mission of the Department of Mechanical Engineering is to provide an excellent education that will prepare students to become members of the next generation of mechanical engineers. To implement this mission, the department adheres to the following set of educational objectives: to provide a balanced technical and nontechnical education to enable graduates to enter highly selective graduate schools and/or to pursue technical careers in industry or government laboratories; to enable graduates to improve and adapt their skills to accommodate rapid technological changes; to prepare graduates to communicate effectively and to understand the ethical responsibilities and impact on society of their profession. To achieve these objectives, the following fundamental educational goals have been established for the Department of Mechanical Engineering: to provide a comprehensive introduction to basic science and mathematics, which form the foundation of mechanical engineering; to provide thorough training in analytical and experimental methods and in data analysis, including problem formulation; to provide instruction in the fundamentals of the design process, including project innovation, synthesis, and management, both individually and in a team setting; to provide both a technical and a nontechnical program of study in which oral and written communication skills are developed; and to instill in students an understanding of their professional and ethical responsibilities, which affect society and their profession.

COURSES FOR NONMAJORS

Mechanics and mechanical engineering content can be found in several courses intended for those not majoring in science. See Engineering and Applied Science.

THE MECHANICAL ENGINEERING PROGRAM

At Yale, three mechanical engineering programs are offered: a B.S. degree program with a major in Mechanical Engineering, a B.S. degree program with a major in Engineering Sciences (Mechanical), and a B.A. degree program with a major in Engineering Sciences (Mechanical). Prospective majors in both B.S. programs are advised to complete introductory physics and mathematics through calculus (MATH 1150) by the end of their first year.

A student's undergraduate engineering program may include one or more special project courses MENG 4991 or MENG 4992 in which the student pursues a particular research interest through design-oriented projects and experimental investigations. Projects may be initiated by the student, may be performed in a team, or may be derived from the ideas of faculty members who place undergraduates in their ongoing research projects. All interested students should contact the director of undergraduate studies (DUS) for more information on special project courses.

B.S. degree program in Mechanical Engineering This is the most technically intensive mechanical engineering degree program and is accredited by the Engineering Accreditation Commission of ABET, Inc. This program is appropriate for students who plan careers as practicing engineers in industry, consulting firms, or government, as well as for students who are considering a career in research and plan to pursue an advanced degree in engineering.

B.S. degree program in Engineering Sciences (Mechanical) This non-ABET degree program is suitable for students who wish to gain significant expertise within mechanical engineering while combining their engineering studies with related disciplines. For example, a number of students have taken courses in architecture while pursuing a program in mechanical engineering that emphasizes structural mechanics; similarly, a student with an interest in computer graphics might combine engineering courses in computer-aided design with programming courses from the Department of Computer Science.

B.A. degree program in Engineering Sciences (Mechanical) In a society with increasing levels of technical sophistication, a well-rounded individual must have some background in science and technology. The non-ABET B.A. program is designed for students who may be planning careers in business, law, economics, medicine, journalism, or politics but need to understand the impact that science and technology can have on society at large. An understanding of engineering methods and practices, combined with a traditional liberal arts education, provides a strong background for a variety of careers. The program is well suited for students who wish to fulfill the requirements of two majors.

The major for all three degree programs requires a group of prerequisites or equivalents; several courses beyond the prerequisites; and a senior requirement, as indicated below.

PREREQUISITES

B.S. degree program in Mechanical Engineering The prerequisites in mathematics are MATH 1120, MATH 1150, and ENAS 1510, or the equivalent. The basic science prerequisites are PHYS 1800, PHYS 1810, or PHYS 2000, PHYS 2010; one laboratory from PHYS 1650L or PHYS 2050L, and one from PHYS 1660L or PHYS 2060L, or equivalents, and one introductory lecture course in chemistry, numbered CHEM 1610 or higher. The chemistry lecture course may be waived for a Chemistry AP score of 4 or 5 or an IB Higher level or Standard level score of 6 or 7.

B.S. degree program in Engineering Sciences (Mechanical) The prerequisites in mathematics are MATH 1120, MATH 1150, and ENAS 1510, or the equivalent. The basic science prerequisites are PHYS 1800, PHYS 1810, or PHYS 2000, PHYS 2010; one laboratory from PHYS 1650L or PHYS 2050L, and one from PHYS 1660L, PHYS 2060L, or MENG 2616L.

B.A. degree program in Engineering Sciences (Mechanical) The prerequisites in mathematics are MATH 1120 and MATH 1150. The basic science prerequisite is physics at least to the level of PHYS 1700, PHYS 1710.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Mechanical Engineering major requirements.

B.S. degree program in Mechanical Engineering requires twenty courses for 19.5 credits beyond the prerequisites as follows:

1. Advanced mathematics: ENAS 1940 and MATH 2220 or MATH 2250

2. Mechanical engineering and related: MENG 1105, 2511, 2311, 2615, MENG 2616L, 3125, 3422, MENG 3423L, 3323, 3424, MENG 3020L, MENG 4137L and MENG 4138L (the senior requirement), ENAS 1300, ECE 2000

3. Technical electives: three approved technical electives chosen in consultation with the DUS; only one course from MENG 4991 or MENG 4992 may be counted as one of the three technical electives.

The curriculum in this program is arranged in prescribed patterns, but some departures from it are possible with approval of the DUS.

B.S. degree program in Engineering Sciences (Mechanical) The major requires twelve approved course credits in engineering (with only one course from MENG 4991 or MENG 4992), beyond the prerequisites and including the senior project, which can cover a broad array of topics within the subject, provided that they contribute to a coherent program. Students should consult with the DUS at the beginning of their sophomore year.

B.A. degree program in Engineering Sciences (Mechanical) The program requires eight approved course credits in engineering (with only one course from MENG 4991 or MENG 4992), beyond the prerequisites, including the senior project. Students should consult with the DUS at the beginning of their sophomore year.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval

SENIOR REQUIREMENT

B.S. degree program in Mechanical Engineering Students satisfy the senior requirement by taking MENG 4137L (full-credit) and MENG 4138L (half-credit) in the senior year.

B.S. degree program in Engineering Sciences (Mechanical) Students satisfy the senior project requirement by completing MENG 4154; MENG 4991 or MENG 4992; or another upper-level design course (taken during the senior year) chosen in consultation with the DUS. Only one Special Projects Course (MENG 4991 or 4992) may be counted toward the requirements of the major.

B.A. degree program in Engineering Sciences (Mechanical) Students satisfy the senior project requirement by completing MENG 4991 or MENG 4992; or another upper-level design course (taken during their senior year) chosen in consultation with the DUS. Only one Special Projects Course (MENG 4991 or 4992) may be counted toward the requirements of the major.

SUMMARY OF MAJOR REQUIREMENTS

MECHANICAL ENGINEERING, B.S.

Prerequisites MATH 1120, MATH 1150, and ENAS 1510, or equivalent; PHYS 1800, PHYS 1810, or PHYS 2000, PHYS 2010, and 2 labs (1 from PHYS 1650L or PHYS 2050L; 1 from PHYS 1660L or PHYS 2060L, or equivalents), and 1 introductory chemistry lecture course or equivalent

Number of courses 20 courses and 19.5 credits beyond prerequisites (including senior req)

Specific courses required ENAS 1300 and 1940; ECE 2000; MATH 2220 or MATH 2250; MENG 1105, 2511, 2311, 2615, MENG 2616L, 3125, 3422, MENG 3423L, 3323, 3424, MENG 3020L

Distribution of courses 3 technical electives chosen in consultation with DUS (only one of MENG 4991 or MENG 4992)

Substitution permitted With DUS approval

Senior requirement MENG 4137L and MENG 4138L taken in senior year

ENGINEERING SCIENCES (MECHANICAL), B.S.

Prerequisites MATH 1120, MATH 1150, and ENAS 1510, or equivalent; PHYS 1800, PHYS 1810, or PHYS 2000, PHYS 2010, and 2 labs (1 from PHYS 1650L or PHYS 2050L; 1 from PHYS 1660L, PHYS 2060L, or MENG 2616L)

Number of courses 12 course credits beyond prerequisites (incl senior req)

Substitution permitted With DUS approval

Senior requirement MENG 4154; MENG 4991 or MENG 4992; or another upper-level design course chosen in consultation with the DUS

ENGINEERING SCIENCES (MECHANICAL), B.A.

Prerequisites MATH 1120, MATH 1150; PHYS 1700, PHYS 1710 or higher

Number of courses 8 course credits beyond prerequisites (incl senior req)

Substitution permitted With DUS approval

Senior requirement MENG 4991 or MENG 4992; or another upper-level design course chosen in consultation with the DUS

FACULTY OF THE DEPARTMENT OF MECHANICAL ENGINEERING AND MATERIALS SCIENCE

Professors Ira Bernstein (*Emeritus*), Aaron Dollar, Juan Fernández de la Mora, Alessandro Gomez, †Sohrab Ismail-Beigi, †Shun-Ichiro Karato, Marshall Long (*Emeritus*), Corey O'Hern, †Vidvuds Ozolins, †Brian Scassellati, Jan Schroers, Udo Schwarz (*Chair*), Mitchell Smooke

Associate Professors Rebecca Kramer-Bottiglio, Madhusudhan Venkadesan

Assistant Professors Ian Abraham, Yimin Luo, Amir Pahlavan, Bauyrzhan Primkulov, Daniel Wiznia

Senior Lecturer Beth Anne Bennett

Lecturers Lawrence Wilen, Joseph Zinter

†A joint appointment with primary affiliation in another department or school.

Medieval Studies Certificate

Certificate director: Emily Thornbury (emily.thornbury@yale.edu); 432-0672; Medieval Studies

This certificate is available to all interested Yale College students, and provides them an opportunity to pursue a focused curriculum, in addition to their major, that will strengthen their liberal arts education. Medieval Studies is the interdisciplinary study of the histories, languages, and cultures of the medieval period worldwide. This certificate provides a curated set of courses across a range of departments—including, but not limited to, East Asian Studies, English, History, History of Art, Near Eastern Languages and Civilizations, and Religious Studies—to expand and deepen those interests.

The certificate requirements are flexible enough to offer structure and guidance to those students with a general interest in Medieval Studies, as well as accommodate interdisciplinary breadth for students whose research is already focused on the medieval period.

REQUIREMENTS

See Links to the attributes indicating courses approved for the certificate requirements.

Students must successfully complete five course credits on medieval topics, drawn from the list of approved courses posted each semester on the Medieval Studies website. Other course credits may be approved by permission of the certificate director and the course instructor.

Of the five credits: no more than three may originate in the same zone. As currently configured, the four zones are East and Southeast Asia, South and Central Asia, the Near East and North Africa, and Europe, Russia, and the North Atlantic. Students may search for courses that count toward the certificate in YCS by using the attributes indicated below.

Additionally, no more than two course credits may overlap in the fulfillment of the requirements of the Medieval Studies Certificate or of a major, a simultaneous degree, or another certificate. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major.

In addition to the course requirements, each student must attend three lectures on medieval topics. After each lecture, students should submit a 1–2 page account of the lecture to the certificate director or one of the certificate advisors to be credited for attendance. There are typically six Yale lectures in Medieval Studies every academic year, as well as weekly Medieval Lunch talks. Events in other departments, or outside Yale, may also count toward the lecture requirement. Notice of relevant events can be found on the Medieval Studies website.

Credit/D/Fail Only one course taken Credit/D/Fail may be applied toward the requirements of the certificate.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

DECLARATION OF CANDIDACY

Students interested in learning more about the certificate should complete the form found on the Medieval Studies website or contact the certificate director. Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Number of courses 5 course credits dispersed between the four geographic zones

Distribution of courses up to 3 courses in any one of the four zones

Additional requirements attendance at 3 Medieval Studies lectures, each followed by a 1–2 page account of the event

Modern Middle East Studies

Director of undergraduate studies: Jonas Elbousty (jonas.elbousty@yale.edu); www.yale.edu/macmillan/cmes

The Modern Middle East Studies major focuses on the culture, history, religion, politics, and society of the modern Middle East in its full geographical breadth, while developing expertise in any of the major languages associated with the region, namely Arabic, Hebrew, Persian, and Turkish. Courses are drawn from departments in the humanities and social sciences, including Anthropology, History, History of Art, Jewish Studies, Political Science, Near Eastern Languages and Civilizations, Religious Studies, and Sociology. The Modern Middle East Studies major gives students the analytical and linguistic skills necessary to master the complex issues of the Middle East and serves as excellent preparation for graduate study or for professional careers in which an understanding of that region is essential.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Modern Middle East major requirements.

The major allows students to develop highly individualized courses of study, tailored to their own academic, intellectual, and linguistic interests. There are no prerequisites. Twelve term courses are required for the major, including one course at the L5 level in a Middle Eastern language and two survey courses on the modern period, taken at the introductory level. Beyond those requirements, students take eight distribution courses focusing on any aspect of the culture, thought, history, religion, politics, and society of the region. These eight distribution courses must be spread geographically and temporally and draw from distinct methodological or disciplinary approaches. They must include, at a minimum, two courses from different regions or countries within the Middle East, two courses from different departments or programs, two courses that focus substantially on the period before 1750, and two advanced seminars. Up to two language courses below L5 in a Modern Middle East language may count toward the distributional requirement with the approval of the director of undergraduate studies (DUS). The proposed course of study also requires DUS approval.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students in the major undertake a one- or two-term senior essay that involves use of materials in one or more modern Middle Eastern languages. Each student selects a faculty adviser with competence in the appropriate language. A prospectus and outline signed by the adviser must be submitted to the DUS by the end of the fourth week of classes in either term of the senior year. Senior essays are graded by the adviser and a second reader. See the course descriptions of the senior essay courses (MMES 4491, 4492, 4493) for further information. Alternatively, under supervision of the instructor,

majors may take an additional seminar and write an essay in that course to fulfill the senior requirement.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses

Distribution of courses 2 intro survey courses on the Middle East, focusing on the modern period; 2 courses from different Middle Eastern regions or countries; 2 courses from two different departments or programs; 2 courses with focus on pre-1750; 2 adv seminars; and 1 course at L5 level in a Middle East language

Substitution permitted With DUS approval, up to 2 language courses below L5 in Modern Middle East language may count toward distributional requirement

Senior requirement One-term senior essay (MMES 4491), two-term senior essay (MMES 4492, 4493), or essay written in additional seminar

FACULTY ASSOCIATED WITH THE PROGRAM OF MODERN MIDDLE EAST STUDIES

Professors Frank Griffel (*Religious Studies*), Hannan Hever (*Comparative Literature*), Marcia Inhorn (*Anthropology*), Ivan Marcus (*History*), Alan Mikhail (*History*), A. Mushfiq Mobarak (*School of Management*), Kishwar Rizvi (*History of Art*), Maurice Samuels (*French*), Shawkat Toorawa (*Near Eastern Languages & Civilizations*)

Associate Professors Thomas Connolly (*French*), Robyn Creswell *(Comparative Literature),* Zareena Grewal (*American Studies*), Kaveh Khoshnood (*Public Health*), Eliyahu Stern (*Religious Studies*), Jonathan Wyrtzen (*Sociology*), Travis Zadeh (*Religious Studies*)

Assistant Professors Supriya Gandhi (*Religious Studies*), Samuel Hodgkin (*Comparative Literature),* Jill Jarvis (*French*), Elizabeth Nugent (*Political Science*), Eda Pepi (*Women's, Gender, & Sexuality Studies*), Claire Roosien (*Slavic Languages and Literatures*), Evren Savci (*Women's, Gender, & Sexuality Studies*)

Senior Lecturer Tolga Köker (*Economics*)

Lecturers Karla Britton (*Architecture*), Teresa Chahine (*School of Management*), Emma Sky (*Global Affairs*)

Senior Lectors II Sarab Al Ani, Shiri Goren

Senior Lectors Muhammad Aziz, Jonas Elbousty, Dina Roginsky, Farkhondeh Shayesteh, Orit Yeret

Lector Ezgi Yalcin

Molecular Biophysics and Biochemistry

Director of undergraduate studies: Andrew Miranker, (andrew.miranker@yale.edu)
318 BASS, 432-8954, MBBUndergrad@yale.edu; mb&b.yale.edu

Members of the Department of Molecular Biophysics and Biochemistry (MB&B) are united by a common view that processes in biology are understood when molecular, chemical, kinetic, and thermodynamic contributions to mechanisms have been elucidated. Correspondingly, our faculty and students are joined by a shared fascination with biochemistry, physical chemistry, structural biology, computation, spectroscopy, macromolecular engineering, imaging and the molecular basis of disease.

Three quarters of our graduates matriculate into PhD, MD, and MD/PhD programs. Other recent graduates have joined companies specializing in finance, management consulting, biotechnology, and pharma. Others have matriculated in law or business school and doctoral programs in the humanities. Still others have performed public service, entered secondary education, or joined the United States armed forces as officers.

INTRODUCTORY COURSES

The basic introductory science courses suggested for all majors include a two-term lecture sequence in general chemistry with its associated laboratories (CHEM 1610, 1650, or CHEM 1630, 1670, and CHEM 1340L and 1360L); a one-term course in organic chemistry with its associated laboratory (CHEM 2200 or 1740 with CHEM 2220L); two terms of calculus (MATH 1120 and 1150 or MATH 1160); two half-term units of biochemistry, biophysics and cell biology (BIOL 1010, 1020). Some concentrations, described below, require additional introductory biology satisfied by (BIOL 1030, 1040).

REQUIREMENTS OF THE MAJOR

The core elements of the major are biophysics, biochemistry, and science and society. The requirements beyond these core elements teach advanced concepts, and teach the technology and practical skills that enable scholarship in the discipline.

B.A. Degree Program The B.A. degree program requires a total of 9.5 course credits to include: 3 biophysics credits; 3 biochemistry credits, a half-credit for science and society; 1 credit to fulfill the practical skills requirement; 1 elective; and the senior requirement.

The *core Biophysics requirements* are two semesters of physics (PHYS 1700 and 1710 or higher) and one semester of biophysical chemistry (MB&B 2750 or CHEM 3320).

The *core Biochemistry requirements* include MB&B 3000 and 3010 (substitutions are not permitted), and CHEM 1750 or any 2000+ level Chemistry course.

The *Science and Society core requirement* is 0.5 credit (MB&B 2680 is recommended) and addresses the intersection of Molecular Biophysics & Biochemistry with human identity and society. Alternatives to MB&B 2680 are MB&B 1070, AFAM 1370, HSHM 2060, 241, 4060, 4240, 4750, 4810, HIST 1779, SOCY 1600, 1601, 3760, MCDB 3750, WGSS 2270, 4457. Students may petition for course substitutions.

The *Practical skills* requirement is fulfilled with one full-credit or two half-credit courses spread across two or three of the categories listed below. At least one half-credit must come from MB&B.

• Physics lab options include MB&B 1210L, 1220L, 1230L, 1240L, 4700 and 4710*, PHYS 1650L, 1660L, CHEM 3550L, other 2000+ level lab courses with DUS approval.

• Biochemistry Lab options include MB&B 2510L, 4700 and 4710*, CHEM 3550L, other 2000+ level lab courses with DUS approval.

• Critical Tools options include MB&B 4350, 4700 and 4710*, S&DS 2380, CPSC 1001 and others with DUS approval.

*MB&B 4700 and 4710 are research for credit courses. Above categorization is dependent on the research project. Up to two credits may be taken for a letter grade.

The *Elective course* should be a lecture or seminar MB&B course at the 2000+ level.

B.S. Degree Program The B.S. degree program requires a total of 12.5 course credits including the senior requirement. This program follows the requirements and policies of the B.A. degree program with the following additions.

For the *core Biophysics requirement:* one additional 3000+ course in physical sciences, mathematics, statistics or computer science

For the *Practical Skills requirement:* one additional credit for a total of two credits

For the *elective courses:* one additional 2000+ level seminar or lecture course in STEM

Combined B.S./M.S. Degree Program The B.S./M.S. degree program requires a total of 18.5 course credits including the senior requirement. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult their academic adviser prior to the fifth term of enrollment for details and application requirements (due December 1 of the fifth semester). The B.S./M.S. program follows the requirements of the B.S. Degree program with the following additions.

For the *core Biophysics requirement:* one additional 3000+ course in thermodynamics, statistical mech, quantum and/or spectroscopy (CHEM 3320 is recommended). PHYS 1800 and 1810 in place of PHYS 1700 and 1710.

The *Practical Skills* requirement is replaced by one semester of MB&B 4700 or MB&B 4710 which must be completed by the end of the fifth semester.

For the *Elective course,* the single MB&B 2000+ seminar or lecture elective is replaced by two MB&B electives at 5000+ and four 5000+ electives in STEM.

CONCENTRATIONS

Concentrations in MB&B are sets of electives, curated by faculty, designed to focus attention on specific subfields of Molecular Biophysics and Biochemistry. Concentrations appear on a student's official Yale transcript and are currently available in Biochemistry; Biophysics and Structural Biology; Chemical Biology; Computational Biology and Bioinformatics; Environment and Climate Change; and Medicine. Students must fulfill all major degree requirements,

earning a concentration is optional. For specific concentration requirements see the Concentrations section.

Electives taken for the major that meet the same criteria as requirements for a concentration may be used to fulfill both requirements. Placement exams and acceleration credits do not count towards completion of concentration-specific requirements. Instead, majors enroll in higher-level courses in the same concentration-specific category. Depending on the particular concentration and the choice of electives, concentrations add between zero and three additional credits to major requirements.

Some concentrations include research-for-credit courses or course-based undergraduate research experiences (CUREs) as a mechanism to fulfill a requirement. These courses must directly relate to the chosen concentration (broadly interpreted) and require DUS approval.

Credit/D/Fail No more than one course taken Credit/D/Fail may be applied toward the requirements of the major. This does count against Yale's limit of 6 total Credit/D/Fail courses. Qualifying courses must be 4000+ in MB&B, and 3000+ in any other STEM subject. For B.S./M.S. students, all required coursework must be taken for a letter grade.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The senior requirement for both the B.S. and the B.A. is fulfilled by successful completion of a one credit senior essay. Students may enroll in MB&B 4900 and prepare a written report and make an oral presentation of a literature project or students may enroll in MB&B 4910 and write an essay that draws on laboratory research performed at Yale College. Students meet with faculty members in charge of the courses during the first two weeks of the term in which they are writing their essay, to agree on a topic and an approach. It is appropriate for students who took research for credit earlier in their training to write on their research topic. The literature project for the senior requirement should be original work approved by the faculty member overseeing MB&B 4900.

The senior requirement for B.S./M.S. is completion of MB&B 5700 and 5701 taken during senior year.

ADVISING

Students are encouraged to declare their major long before completion of the introductory courses. This greatly improves academic advising. Changing majors at Yale does not require approval and is non-binding.

Students are assigned a member of MB&B faculty for academic advising as soon as they declare their major. Requests to change advisers should be sent to the registrar via email (elizabeth.vellali@yale.edu). Justification is not required nor is DUS approval.

Course Substitutions Students may petition their MB&B academic adviser for course substitutions by assembling the relevant syllabi and writing a short justification (less

than 300 words). Thoughtful requests in line with MB&Bs teaching goals are always welcome.

DUS approvals: DUS approvals for waivers, course substitutions, endorsement of petitions to the Committee on Honors and Academic Standing, applications to the B.S./M.S. program etc., are initiated by an email of support from student's assigned MB&B academic adviser. The academic adviser functions as the student's advocate on requests to the DUS with the MB&B registrar giving oversight and interfacing with the University registrar. One-on-one meetings by majors with their MB&B academic adviser during every registration period are logged. Failure to schedule meetings and missed meetings are factored into the DUS approval process.

Graduate work Graduate courses in molecular biophysics and biochemistry, biology, and the biomedical sciences that may be of interest to undergraduates are listed in the Graduate School online bulletin, and many are posted on the Biological and Biomedical Sciences website. Additional information is available from the DUSs and the director of graduate studies. Undergraduates with an appropriate background may enroll with the permission of the director of graduate studies and the instructor.

Combined B.S./M.S. degree program A very small number of students will be eligible to complete a four-year course of study within 8 terms of enrollment leading to the simultaneous award of the B.S. and M.S. degrees. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult their academic adviser prior to the fifth term of enrollment.

Sample schedules Diverse pathways exist for navigating the B.A. and B.S. degrees. In general, students are strongly encouraged to complete General Chemistry (e.g. CHEM 1610, 1650, 1340L and 1360L), introductory calculus (e.g. MATH 1120) and introductory Biochemistry, Biophysics and Cell Biology (BIOL 1010, 1020) by the end of their first year. See the MB&B website for 4-year sample degree programs covering all six concentrations and for students who do not elect to pursue a concentration.

SUMMARY OF MAJOR REQUIREMENTS

Introductory courses BIOL 1010 and 1020; 2 terms general chem with associated labs; 1 term organic chem with associated lab; 2 terms of calculus; BIOL 1030 and 1040 for some concentrations

Number of courses *B.A.*–9.5 course credits (incl senior project); *B.S.*–12.5 course credits (incl senior project)

Distribution of courses *B.A.*–3 biophysics credits to incl MB&B 2750 or CHEM 3320 and PHYS 1700 and 1710 or higher; 3 biochemistry credits to incl MB&B 3000, 3010, and CHEM 1750 or 2000+ Chem course; MB&B 2680, a half-credit for science and society or other course as approved by DUS; 1 credit practical skills course(s); and 1 MB&B elective 2000+ level or higher; *B.S.*–same reqs as for B.A.degree plus 1 addtl Practical Skills credit; 1 addtl 3000+ biophysics credit; and one addtl 2000+ credit in STEM

Senior requirement MB&B 4900 or MB&B 4910

CONCENTRATIONS

BIOCHEMISTRY CONCENTRATION

The concentration in Biochemistry is geared towards students seeking robust training in structure and function of nucleic acids and proteins in the context of life processes. Molecular length scale biochemistry is foundational to the mechanisms by which dynamic networks of molecular machines enable everything from cellular function to whole organism physiology. Failures in these networks are responsible for pathology in plants and animals, agriculture and medicine. MB&B majors interested in working in these fields directly after graduation, or who hope to pursue graduate studies including PhD and MD/PhD, are particularly encouraged to fulfill this concentration.

In addition to, or as part of, the degree requirements, the following courses are required:

Genetics a*nd Development and Ecology and Evolution*: BIOL 1030 and 1040

Molecular, Cellular, or Organismal Biology: MCDB 2050, MCDB 2020, or as approved by the DUS

Research in Biochemistry: MB&B 4700 or MB&B 4710 or course-based undergraduate research

Advanced Chemical Biology lecture or seminar (1 credit for B.A. degree and 2 credits for B.S. degree): 3000+ courses such as MB&B 3650, MB&B 3310, MB&B 4450, MB&B 4490, or MB&B 4430

BIOPHYSICS AND STRUCTURAL BIOLOGY CONCENTRATION

This concentration is designed for students with strong interests in life processes on the molecular length scale. Majors aspiring to graduate studies in biophysics, molecular medicine, and biotechnology are particularly encouraged to fulfill this concentration.

Biophysics and Structural Biology are made possible by fundamental quantitative and physical tools such as linear algebra, Fourier analysis, x-ray diffraction, imaging, and optical spectroscopy to measure biomolecular dynamics and atomic resolution structure. Seminar courses applicable to this area focus on the basic biology enabled by exquisitely specific macromolecular interactions, the molecular basis of disease and drug-design.

In addition to, and/or as part of, the degree requirements, the following courses are required:

Computer Science, Math, Statistics (for B.A. degree): one from MATH 1200, MATH 2250, S&DS 1000+, or CPSC 1001

Computer Science, Math, Statistics (for B.S. degree): one from MATH 1200, MATH 2250, S&DS 2380, or CPSC 1001

Biophysical Chemistry (for B.S. degree): one from CHEM 3320 or any 3000+ elective in thermodynamics, statistical mech, quantum mechanics or spectroscopy

Research in Biophysics and Structural Biology (for both degrees): one from MB&B 4700, MB&B 4710, CHEM 3550L, or course-based undergraduate research

Tools and Quantitative Analysis (for B.S. degree): one 2000+ course with emphasis on measurement and/or modeling of energy, kinetics, or structure relevant to the molecular length scale, such as MB&B 3300, MB&B 4200, MB&B 4350, CHEM 3330, CHEM 4060, CHEM 4920, or as approved by the DUS

Advanced Biophysics and Structural Biology lecture or seminar (both degrees): one from MB&B 4200, MB&B 5200, or as approved by the DUS

CHEMICAL BIOLOGY CONCENTRATION

Chemical Biology leverages the tools and concepts of chemistry to understand and/or manipulate biological processes. Students interested in the MB&B concentration in Chemical Biology select electives from organic and inorganic chemistry as well as advanced courses in cell biology. Majors interested in additional studies in chemical biology, drug development, and/or biotechnology after graduation are particularly encouraged to fulfill this concentration.

In addition to, or as part of, the degree requirements, the following courses are required:

Organic Chemistry (both degrees): second semester of Organic Chemistry and accompanying half-credit lab

Cell Biology and Chemistry (for B.S. degree only): two 2000+ electives *and* one 3000+ elective in Chemistry or Cell Biology (at least one credit must cover cell biology or chemistry)

Cell Biology (for B.A. degree only): one 2000+ elective in cell-based biology

Research in Chemical Biology (both degrees): one from MB&B 4700, MB&B 4710, or MB&B 3640, or course-based undergraduate research

Advanced Chemical Biology lecture or seminar (both degrees): MB&B 4430 or CHEM 4190 or as approved by the DUS

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS CONCENTRATION

This concentration is designed for students with strong interests in computer science, data science, statistics, and biology. Majors aspiring to graduate studies in computational biology, bioinformatics, medical informatics or biotechnology are particularly encouraged to fulfill this concentration.

In addition to, and/or as part of, the degree requirements, the following courses are required:

Genetics and Evolutionary Biology (B.A. degree): BIOL 1030 and 1040

Genetics and Evolutionary Biology (B.S. degree): one 2000+ elective in genetics, MCDB 2000, MCDB 2020, MCDB 3100, MB&B 3310

Computer Science, Math, Statistics (B.A. degree): CPSC 2010 *and* one S&DS 1000+ course

Computer Science, Math, Statistics (B.S. degree): CPSC 2230, CPSC 2010, and S&DS 2380 (CPSC 2230 may also be used to fulfill the 3000+ core biophysics elective requirement). Other courses may be substituted with permission of the DUS.

Advanced Computational Biology & Bioinformatics (both degrees): MB&B 3520 or CPSC 4530 or as approved by the DUS.

ENVIRONMENT AND CLIMATE CHANGE CONCENTRATION

This concentration is geared towards students seeking robust training in life processes as they affect, and are affected by the environment, human activity, and climate change. MB&B majors interested in working in these fields directly after graduation, or who hope to pursue graduate studies are particularly encouraged to fulfill this concentration.

In addition to, or as part of, the degree requirements, the following courses are required:

Physical environmental science (for B.S. degree): one credit 3000+ course from EVST 3620, EPS 3100, EPS 3230, EPS 3350, CHEM 3320, or CHEM 3330

Environmental chemistry (both degrees): one credit 2000+ course from EVST 3307, EPS 3100, CHEM 2520, or ENVE 4380. May be used to fulfill 2000+ elective requirement in chemistry.

Math, statistics and/or computer science (both degrees): one credit course from MATH 1200, MATH 1210, MATH 2220 or higher, S&DS 1000 or higher, or CPSC 1001 or higher. May be used to fulfill the practical skills requirement.

Ecology and evolution (both degrees): one credit 1000+ course from BIOL 1040, EEB 2225, or ANTH 2667. May be used to fulfill the 2000+ STEM requirement for the B.S. degree.

Environmental Sciences (both degrees): one credit 1000+ course from CENG 1200, EVST 2200, EVST 2550, EPS 1010, EPS 1250, EPS 1400, EPS 2320, or EPS 2610. May be used to fulfill 2000+ STEM requirement for B.S. degree.

Advanced Environment Lecture or Seminar (one credit for B.A. degree/two credits for B.S. degree): one or two credit courses from MB&B 3650, ENVE 4640, EVST 4005, EPS 3550, ENVE 4100, EPS 3230, ENVE 3600, ENVE 4380. MB&B 3650 may be used to fulfill 2000+ MB&B requirement for all degrees.

MEDICINE CONCENTRATION

This concentration is designed for students with strong interests in the molecular basis of physiology and disease. Majors aspiring to graduate studies in biomedical sciences, work in biotechnology, or medical school are particularly encouraged to fulfill this concentration.

In addition to, or as part of, the degree requirements, the following courses are required:

Genetics and Development: BIOL 1030 and 1040

Organic Chemistry: second term of organic chemistry (CHEM 1750 or 2210)

Statistics: Any introductory S&DS 1000+ or a 2000+ MATH course in linear algebra, probability, statistics or stochastic processes

Psychology: PSYC 1100 or higher

Physics labs (1 credit): MB&B 1210L, MB&B 1240L, PHYS 1650L, 1660L, MB&B 3640, or others as approved by the DUS (see below).

Biomedical research (total for 1 credit): MB&B 4700 or MB&B 4710, or course based undergraduate research including MB&B 2510L, MCDB 2910L, or others

Advanced Seminar: one
from MB&B 4450, MB&B 3520, MB&B 4490, MCDB 3150, MCDB 4500, or others as approved by the DUS.

FACULTY OF THE DEPARTMENT OF MOLECULAR BIOPHYSICS AND BIOCHEMISTRY

Professors †Karen Anderson, Susan Baserga, †Ronald Breaker, †Gary Brudvig, †Sandy Chang, Enrique De La Cruz, †Daniel DiMaio, Donald Engelman, Mark Gerstein, Wendy Gilbert, Nigel Grindley (*Emeritus*), Mark Hochstrasser, Jonathon Howard, Michael Koelle, Anthony Koleske, William Konigsberg (*Emeritus*), †Mark Lemmon, †Patrick Loria, †I. George Miller, Andrew Miranker, †Peter Moore (*Emeritus*), Karla Neugebauer, Lynne Regan *(Emeritus)*, †Karen Reinisch, †David Schatz, Christian Schlieker, Robert Schulman (*Emeritus*), †Frederick Sigworth, Dieter Söll (*Emeritus*), Mark Solomon, Joan Steitz, Scott Strobel, Steven Tang, Yong Xiong

Associate Professors Julien Berro, †Titus Boggon, †Erdem Karatekin, Nikhil Malvankar, Matthew Simon, †Sarah Slavoff, †Shervin Takyar, †Yongli Zhang

Assistant Professors Franziska Bleichert, Allison Didychuk, †Luisa Escobar-Hoyos, Lilian Kabeche, †Wei Mi, Candice Paulsen, Kai Zhang

Adjunct Professors Kenneth Williams, Carl Zimmer

Lecturer Ghazia Abbas

†A joint appointment with primary affiliation in another department.

Molecular, Cellular, and Developmental Biology

Director of undergraduate studies: Douglas Kankel (douglas.kankel@yale.edu) (spring 2025); Stephen Dellaporta (stephen.dellaporta@yale.edu) (fall 2025, spring 2026); MCDB undergraduate registrar (mcdb.ureg@yale.edu): Andrea Chamba, (mcdb.ureg@yale.edu) 432-3839; mcdb.yale.edu

The science of biology is extremely broad, ranging across the domains of molecules, cells, tissues and organs, organisms, and ecosystems. Moreover, biology explores questions of evolutionary history and the processes of evolutionary change, as well as the mechanisms by which cells, organisms, and ecosystems function. Students majoring in Molecular, Cellular, and Developmental Biology receive a thorough yet varied liberal education and preparation for professional careers in a diverse array of fields. Practical applications of biology include the development of biologicals and pharmaceuticals, the practice of medicine, and the pursuit of the scientific bases for understanding the development and function of biological systems.

Molecular, Cellular, and Developmental Biology (MCDB) offers programs for students wishing to concentrate on molecular and cellular biology and genetics, with applications to problems in cell and developmental biology, neurobiology, and various aspects of quantitative biology. Interdisciplinary opportunities are available within the major in the Biotechnology, Neurobiology, and Quantitative Biology concentrations (previously tracks).

The MCDB major offers many opportunities for independent laboratory research. With approval, research can be conducted under the supervision of faculty members in any Yale department.

PREREQUISITES

Students are held to the prerequisite requirements in place when they declared their major. However, with approval from the DUS and/or course instructors, the following prerequisite Biology requirements, updated for the academic year 2025–2026, may be fulfilled by students who declared the major in a prior term.

Most but not all of the MCDB courses require prior preparation in biological science. First years are suggested to take BIOL 1010, BIOL 1020, BIOL 1030, and BIOL 1040. Students who do not complete this introductory BIOL sequence take one or two (depending on the number of BIOL 1010-1040 modules completed) advanced lecture or seminar courses (MCDB 2000 level or above or equivalent level in some related departments) to fulfill the biology prerequisite. Contact the director of undergraduate studies (DUS) for more information. All majors must also complete a course in mathematics numbered MATH 1150 or higher or a statistics course (S&DS 1000, 1080, 1090, 2380), and other statistic courses taken at Yale with approval from the DUS.

For the B.A. degree, students must take a two-term lecture sequence in chemistry, usually in their first year, and a term course in physics numbered PHYS 1700 or higher usually in their junior year.

For the B.S. degree, students must take a two-term lecture sequence in chemistry, with associated laboratories usually in their first year; a term course in organic chemistry

with its associated laboratory usually in their sophomore year; and two term courses in physics numbered PHYS 1700 or higher usually in their junior year.

PLACEMENT PROCEDURES

Placement in MCDB courses is determined by examinations administered at Yale or by permission of the DUS. A student may place out of one or more courses in the BIOL 1010–1040 sequence. One or more of these foundational biology courses (or equivalent performance on the corresponding biological sciences placement examination) may be explicitly required as prerequisites for upper-level MCDB courses. Students who do not complete the introductory BIOL sequence take one or two (depending on the number of BIOL 1010-1040 modules completed) advanced lecture or seminar courses (MCDB 2000 level or above or equivalent level in some related departments) to complete the biology prerequisite.

Placement in chemistry courses is arranged by the Department of Chemistry. Because required chemistry courses are prerequisite to several MCDB courses, students are strongly encouraged to take general and organic chemistry in the first and/or sophomore years. Students who place out of general chemistry may want to consider taking organic chemistry during the first year. Finishing the prerequisites early allows for a more flexible program in later years.

Acceleration credit awarded in chemistry, mathematics, or physics, or completion of advanced courses in those subjects, is accepted in place of the corresponding prerequisites for the MCDB major. Students who have mathematics preparation equivalent to MATH 1150 or higher are encouraged to take additional mathematics courses, such as MATH 1200, 1210, 2220, or 2250, or ENAS 1510 or 1940. Students in the B.A. degree program who have satisfied one or more prerequisites with advanced placement must still complete three term courses in chemistry and physics at Yale, including at least one from each department.

REQUIREMENTS OF THE MAJOR

B.A. degree program The B.A. degree requires a minimum of five and one-half course credits beyond the prerequisites (the same course cannot be used to satisfy both a prerequisite and a core or elective requirement), including five lecture or seminar courses and one laboratory, as follows:

1. Two core courses selected from MCDB 2000, 2020, 2050, 2100, 2900, 3000 (or MB&B 3000)
2. Two general electives selected from MCDB courses numbered 2500 or above, or two additional core courses from the list above. Two laboratory courses, either MCDB 3420L and 3430L or MCDB 3440L and 3450L, can be paired for a single elective credit. If used as an elective, these laboratories cannot also fulfill the laboratory requirement
3. One special elective selected from MCDB courses numbered 3500 or higher
4. One laboratory from the biological sciences. Laboratories may be selected from MCDB, Molecular Biology and Biophysics, or Biomedical Engineering, or, with permission of the DUS, from Anthropology or Ecology & Evolutionary Biology
5. The senior requirement (senior essay option does not carry course credit)

B.S. degree program The B.S. degree requires a minimum of nine course credits beyond the prerequisites (the same course cannot be used to satisfy both a prerequisite and a core or elective requirement), including eight lecture or seminar courses and two laboratories, as follows:

1. Three core courses selected from MCDB 2000, 2020, 2050, 2100, 2900, 3000 (or MB&B 3000)
2. Two general electives selected from MCDB courses numbered 2500 or above. Additional core courses from the list above, a second term of organic chemistry, and a course in statistics may be used as general electives. Two laboratory courses, either MCDB 3420L and 3430L or MCDB 3440L and 3450L, can be paired for a single elective credit. If used as an elective, these laboratories cannot also fulfill the laboratory requirement
3. One special elective from MCDB courses numbered 3500 or higher
4. Two laboratories from MCDB
5. The senior requirement (2 course credits), described below

The B.S. degree program, intensive major Requirements for the B.S. degree program, intensive major, are the same as those for the B.S. degree except for the senior requirement (see below). This degree requires eleven course credits beyond the prerequisites (the same course cannot be used to satisfy both a prerequisite and a core or elective requirement), including 6 courses, 2 half-credit labs, and 2 senior research courses, each worth two credits.

Independent research courses before senior year The only independent research course available to students prior to the senior year is MCDB 4740. This course is graded Pass/Fail and contributes to the thirty-six course credits required for the bachelor's degree, but it does not substitute for any MCDB major requirement, including the senior requirement. No independent research course satisfies a lab requirement for the MCDB major.

Independent research courses during senior year The research courses MCDB 4750, 4850, 4860, and MCDB 4950, 4960 exist primarily to fulfill the senior requirement, and do not satisfy any other requirement for the major. Note that Yale College limits the number of independent study or independent research courses that students may take; see Academic Regulations, section C, Course Credits and Course Loads. Any independent study course, regardless of its number, is included in the total. No independent research course satisfies a lab requirement for the MCDB major.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

In addition to the course requirements described above, all students must satisfy a senior requirement undertaken during the senior year. A booklet listing the senior requirements of each concentration and degree is available in the office of the DUS

(111 YSC). All students must fill out a checklist of requirements and go over it with the MCDB undergraduate registrar, (mcdb.ureg@yale.edu) by the spring term of the junior year.

B.A. degree program For the B.A. degree, the senior requirement can be met either by submitting a senior essay of 15–20 pages evaluating current research in a field of biology, or by successful completion of one term of individual research (MCDB 4750). A senior choosing to fulfill the requirement with a senior essay must consult with a faculty adviser on the scope and literature of the topic and submit the adviser's written approval to the DUS no later than the course selection period of the term in which the paper is due. The senior essay may be related to the subject matter of a course, but the essay is a separate departmental requirement in addition to any work done in a course and does not count toward the grade in any course. The senior essay must be completed and submitted to the office of the DUS by the last day of classes. Students electing this option should obtain an approval form from the office of the DUS. Students who select this option should be aware it carries no credit.

B.S. degree program For the B.S. degree, the senior requirement is usually fulfilled by completing a yearlong research course, MCDB 4850, 4860. The senior requirement must be completed during the senior year. Yale College does not grant academic credit for summer research unless the student is enrolled in an independent research course in Yale Summer Session. Seniors working toward the B.S. degree are expected to spend at least ten hours per week in the lab conducting individual research.

B.S. degree program, intensive major Requirements for the B.S. degree with an intensive major are the same as those for the B.S. degree except that students fulfill the senior requirement by taking MCDB 4950, 4960 for four course credits. Seniors in the intensive major are expected to spend at least twenty hours per week in the lab conducting individual research.

ADDITIONAL INFORMATION AND ADVISING

The prerequisites for the B.S. degree fulfill most of the usual premedical science requirements. Students who choose the B.A. degree can also prepare for medical school by taking additional premedical courses.

Selection of courses A relevant intermediate or advanced course from another department in science, engineering, mathematics, or statistics may be accepted as an elective with permission of the DUS. Many courses in other departments have prerequisites; such prerequisites can be substituted for an upper-level elective with permission of the DUS.

Residential College Seminars cannot be substituted for electives and do not count toward the requirements of the major. The MCDB major should not be taken as one of two majors with Molecular Biophysics and Biochemistry, Ecology and Evolutionary Biology, or Neuroscience.

Advising First-year students considering a major in Molecular, Cellular, and Developmental Biology are invited to consult with the DUS and/or a faculty member in MCDB who is a fellow of their residential college. MCDB majors are required to meet with the MCDB faculty adviser and the departmental undergraduate registrar (mcdb.ureg@yale.edu) once per term and prior to registration. For assistance in

identifying a suitable adviser, students should contact the departmental undergraduate registrar. (mcdb.ureg@yale.edu) Students in the Biotechnology, Neurobiology, or Quantitative Biology concentrations should consult an adviser for their concentration (listed below). Students whose regular adviser is on leave can consult the office of the DUS to arrange for an alternate.

College faculty advisers available to first-year students are listed below.

BF	D. Kankel	MC	H. Keshishian
BK	V. Irish, J. Wolenski, S. Bahmanyar	MY	D. Clark, C. Crews
BR	I. Dawson, T. Emonet, S. Hatzios, J. van Wolfswinkel, D. Breslow	PC	J. Carlson, V. Horsley, N. Dimitrova, J. Yan
DC	P. Forscher, W. Zhong	SM	S. Dellaporta
ES	TBD	SY	S. Nachtergaele
GH	M. Mooseker, R. Wyman	TC	Y. Jacob, M. Moreno
JE	R. Breaker, F. Isaacs	TD	S. Holley

Simultaneous B.S./M.S. degree program Exceptionally able and well-prepared students may accelerate their professional education by completing a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. Students may not enroll in Yale College for more than eight terms in order to qualify for the simultaneous award of both degrees. It is possible to earn both degrees in fewer than eight terms, but not by the use of acceleration credits. The requirements are as follows:

1. Candidates must satisfy the Yale College requirements for the B.S. degree. Students in the program must complete the core courses for the major and choose their 4 electives from graduate-level courses. One of the electives must be a graduate seminar selected with the approval of the DUS. Grades below B– in graduate courses are not accepted.
2. In addition to the courses specified above, students must complete three terms of graduate research courses for six course credits: (1) MCDB 5850, a two-credit course taken in the second term of the junior year. At the start of the course, each student forms a committee comprised of the faculty adviser and two faculty members that meets to discuss the research project. Two of the members of this committee must be members of the MCDB faculty. At the end of the course, the student completes a detailed prospectus describing the thesis project and the work completed to date. The committee evaluates an oral and written presentation of the prospectus and determines whether the student may continue in the combined program; (2) MCDB 5950, 5960, a four-credit, yearlong course that is similar to MCDB 4950, 4960 and is taken during the senior year. During the course, the student gives an oral presentation describing the work. At the end of the course, the student is expected to present his or her work to the department in the form of a poster presentation. In addition, the student is expected to give an oral thesis defense, followed by a comprehensive examination of the thesis conducted by the thesis committee. Upon successful completion of this examination, as well as all other requirements, the student is awarded the combined B.S./M.S. degree.

Students must also satisfy the requirements of Yale College for the simultaneous award of the bachelor's and master's degrees, including the following:

1. To be considered for admission to the program, by the end of their fifth term of enrollment students must have achieved at least two-thirds A or A– grades in all of their courses as well as in all of the courses directly relating to the major, including prerequisites.
2. Students must apply in writing to the DUS and obtain departmental approval no later than the last day of classes in their fifth term of enrollment in Yale College.
3. Students must have the approval of both the DUS and the director of graduate studies to receive graduate credit for the graduate courses they select.
4. Graduate work must not be entirely concentrated in the final two terms, and students in the program must take at least six term courses outside the department during their last four terms at Yale and at least two undergraduate courses during their last two terms.
5. Students must earn grades of A in at least two of their graduate-level term courses (or in one yearlong course) and have at least a B average in the remaining ones.

For more information, see Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees."

STUDY ABROAD

Some programs for study abroad are available to MCDB majors. Approved programs can fulfill some of the requirements for the major. Interested students should consult the DUS and the Center for International and Professional Experience.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites *B.A.*—BIOL 1010, 1020, 1030, 1040 or one or two lecture or seminar courses (depending on number of BIOL modules taken) at or above the MCDB 2000 level; a two-term lecture sequence in chem; one term of PHYS 1700 or above; MATH 1150 or above or a Yale statistics course approved by the DUS; *B.S.*—same as for the B.A. degree, in addition to labs associated with a two-term lecture sequence in chem; 1 term of organic chem with lab; two terms of physics, PHYS 1700 or above

Number of courses *B.A.*—5 courses and 1 lab, totaling at least 5½ course credits beyond the prereqs; *B.S.*—8 courses and 2 labs, totaling at least 9 course credits beyond the prereqs; *B.S., intensive*—8 courses and 2 labs, totaling at least 11 course credits beyond prereqs

Specific courses required *Neurobiology concentration*—MCDB 3200; *Biotechnology concentration*—MCDB 3700; *Quantitative Biology concentration*—MCDB 3310

Distribution of courses The same course cannot be used to satisfy both a prerequisite and a core or elective requirement

B.A.—2 core courses from MCDB 2000, 2020, 2050, 2100, 2900, 3000 (or MB&B 3000); 2 electives numbered MCDB 2500 or above (or 2 addtl core courses); 1 elective numbered MCDB 3500 or above; 1 biology lab; *B.S. and B.S. intensive*—3 core courses from MCDB 2000, 2020, 2050, 2100, 2900, 3000 (or MB&B 3000); 2 electives numbered MCDB 2500 or above (or 2 addtl core courses); 1 elective numbered MCDB 3500 or above; 2 MCDB labs; *Biotechnology, Neurobiology, and Quantitative*

Biology concentrations—same as B.A. and B.S. degree programs, with a specific req (MCDB 3200, 3310, or 3700) and 1 addtl concentration-related elective in place of 2 general electives

Senior requirement *B.A.*—MCDB 4750 taken in senior year, or senior essay; *B.S.*—2 consecutive terms of independent research in senior year, MCDB 4850, 4860; *B.S., intensive major*—MCDB 4950, 4960 in senior year (each course is worth 2 credits)

CONCENTRATIONS

In addition to the requirements for the B.A. degree or the B.S. degree programs, students interested in pursuing one or more concentrations within the MCDB major must complete one required course and one elective from the list of approved courses as indicated. Students may not use the same course to count toward multiple concentrations or major requirements. The difference between the standard major and the concentrations is that the two required general electives are more specific for the various concentrations. The laboratory requirement, special elective (MCDB 3500 and above) and the senior requirement are the same as those for the B.A. degree or the B.S. degree programs. No substitutions are provided for the concentrations.

NEUROBIOLOGY CONCENTRATION

The Neurobiology concentration requires MCDB 3200 and one elective course from BENG 4410, CPSC 4750, MCDB 2500, 3100, 3150, 3610, 4150, 4250, 4300, 4400, PSYC 3376, or S&DS 1010. Students should note that PSYC 1100 is a prerequisite for many psychology courses but does not substitute as an elective in the Neurobiology concentration. Students interested in the Neurobiology concentration should consult an adviser for the concentration.

Neurobiology concentration advisers
J. Carlson, 206 YSB (432-3541)
D. Clark, C148 YSB (432-0750)
T. Emonet, C169 YSB (432-3516)
P. Forscher, 120 YSB (432-6344)
H. Keshishian, 228 YSB (432-3478)
M. O'Donnell, 110 YSB (436-1934)
W. Zhong, 225 YSB (432-9233)

BIOTECHNOLOGY CONCENTRATION

The Biotechnology concentration requires MCDB 3700 and one elective course from MB&B 4200, 4430, BENG 3600, 3400, 4410, 4350, 4630, 4685, CENG 2100, 4110, 4120L, CPSC 4381, 4391, 4700, or 4750. Students interested in the Biotechnology concentration should consult an adviser for the concentration.

Biotechnology concentration advisers
R. Breaker, 311 YSB (432-9389)
C. Crews, 250 YSB (432-9364)
F. Isaacs, 141 YSB (432-3783)
K. Nelson, 137 YSB (432-5013)
J. Wolenski, C112 YSB (432-6912)

QUANTITATIVE BIOLOGY CONCENTRATION

The Quantitative Biology concentration requires MCDB 3310 and one elective course from MCDB 3200, 3610, 4610, BENG 4630, 4767, CPSC 4371, 4750, MB&B 4350, 3520, 5230, PHYS 4020, MATH 2460, 2510, or CPSC 4750, 4371. Students interested in the Quantitative Biology concentration should consult an adviser for the concentration.

Quantitative Biology concentration advisers
D. Clark, C148 YSB (432-0750)
T. Emonet, C169 YSB (432-3516)
D. Kankel, 111 YSB (432-3532)

For a summary of the major requirements, see the Overview page.

FACULTY OF THE DEPARTMENT OF MOLECULAR, CELLULAR, AND DEVELOPMENTAL BIOLOGY

Professors Ronald Breaker, John Carlson, †Lynn Cooley, Craig Crews, Stephen Dellaporta, Thierry Emonet, Paul Forscher, †Mark Hochstrasser, Scott Holley, Vivian Irish, †Akiko Iwasaki, Douglas Kankel, †Paula Kavathas, Haig Keshishian, Mark Mooseker, Thomas Pollard, Anna Pyle, Joel Rosenbaum, †Hugh Taylor

Associate Professors Damon Clark, Joshua Gendron, Valerie Horsley, Farren Isaacs, †Megan King, †Kathryn Miller-Jensen, Weimin Zhong

Assistant Professors Shirin Bahmanyar, David Breslow, Nadya Dimitrova, Stavroula Hatzios, Yannick Jacob, Binyam Mogessie, Sigrid Nachtergaele, Michael O'Donnell, Josien van Wolfswinkel, Jing Yan

Professor Adjunct Robert Bazell

Lecturers †Meghan Bathgate, †Alexia Belperron, Francine Carland, †Surjit Chandhoke, Iain Dawson, †Seth Guller, Amaleah Hartman, Ronit Kaufman, Rebecca LaCroix, Thomas Loreng, †Elizabeth Luoma, Maria Moreno, Kenneth Nelson, †Aruna Pawashe, Joseph Wolenski

†A secondary appointment with primary affiliation in another department or school.

Music

Director of undergraduate studies: Anna Zayaruznaya (anna.zayaruznaya@yale.edu); yalemusic.yale.edu

The Department of Music offers introductory and advanced instruction in the history of music, the theory of music, composition, music technology, and performance. The Music major provides a general music program in the humanities, as well as preparation for graduate studies or music careers.

COURSES FOR NONMAJORS AND MAJORS

Introductory courses, numbered from 1000 to 1999, are open to all undergraduates and require no previous experience in music.

Qualified students, whether majoring in music or not, may offer up to four terms of instruction in performance for academic credit toward the 36-course-credit requirement for the bachelor's degree. Of these four course credits, up to three may be applied to the major in Music. Auditions for lessons are held at the beginning of the fall term; students sign up at the School of Music auditions website. Students who audition for lessons are placed into one of three groups: (1) noncredit instruction for a fee; (2) lessons for academic credit at the intermediate level (MUSI 3245), graded Pass/Fail; or (3) lessons for academic credit at the advanced level (MUSI 4245), graded A–F. Only students with exceptional proficiency are placed into MUSI 4245.

Students accepted for noncredit instruction are charged $550 for ten hours of lessons per term or $350 for six hours of lessons per term. The fees are added to the Student Financial Services bill and are not refundable after the first two weeks of lessons each term.

COURSE NUMBERING

Introductory courses are numbered from 1000 to 1999. Intermediate courses, numbered between 2000 and 3999, may require prerequisites or familiarity with music notation. Advanced courses, numbered between 4000 and 4994, are intended for students who have completed intermediate courses in the relevant field. They are intended primarily for students majoring in music, but they may be elected by others who meet the stated prerequisites.

COREQUISITES AND LESSONS

Students taking MUSI 3245 or 4245 are required to enroll concurrently in a non-introductory music theory or music history course for two terms, or they must complete one term of the theory/history requirement before enrolling in MUSI 3245 or 4245 for the first time, and another before enrolling in MUSI 3245 or 4245 again. MUSI 3245 is taken pass/fail; MUSI 4245 and the corequisites are taken for a letter grade. Eligible corequisites include MUSI 1111 or any course designated as Group I, III, or IV within the music major.

PLACEMENT PROCEDURES

There is no longer a placement test for the music theory curriculum; instead, we invite students to identify the right course for them by using our self-placement guide and consulting with the course instructors.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Music major requirements.

Thirteen courses are required, two intermediate courses and one advanced course in each of four groups, and the senior requirement. Group I (MUSI 2100–2199; 3100–3199; 4100–4199) includes music theory and technology courses focused on the materials and structures of musical works and repertoires. Group II (MUSI 2200–2299; 3200–3299; 4200–4299) includes composition, technology, and performance courses with a practical focus on techniques of artistic production. Group III (MUSI 2300–2399; 3300–3399; 4300–4399) includes lectures and seminars taking a research- and writing-based approach to the Western art-music tradition. Group IV (MUSI 2400–2499; 3400–3499; 4400–4494) includes lectures and seminars taking a research- and writing-based approach to popular or vernacular music or to music of non-Western traditions.

With permission of the DUS, students may count one 1000-level course towards the major in place of an intermediate course within the appropriate group.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Each student majoring in Music must satisfy the senior requirement by completing a senior essay, composition, or recital in MUSI 4996, 4997, 4998, or 4999.

The standard major Students must submit a completed Senior Project Form to the director of undergraduate studies (DUS) by the end of the course selection period in the term during which the project will be completed. The Senior Project Form, available in the departmental office, includes a brief description of the project and a timeline for completion. The form must be signed by the project's primary and secondary advisers, at least one of whom is a member of the faculty of the Department of Music.

The intensive major The intensive major is for students of high standing who are qualified to do sustained independent and original work in music research or in composition. Students wishing to elect the intensive major must register for the senior project in the fall term of their senior year (MUSI 4997–4999). A plan for progress must be included in the project proposal at the beginning of the fall term, specifying a deliverable end-of-term product with approximately the same scope as a one-term senior project. Upon satisfactory completion of this work, a student may be admitted to the intensive major, which consists of a second term of registration for the senior project (MUSI 4997–4999). The additional course for the intensive major is supplementary to the thirteen term courses that constitute the standard major.

ADVISING

Simultaneous B.A./M.A. program Undergraduates with exceptionally strong preparation in music history or music theory may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment.

Students may not enroll in Yale College for more than eight terms to qualify for the simultaneous award of both degrees. Declared majors in Music may apply for the program until the last day of classes in their fifth term of enrollment, if they have completed at least two graduate courses in the Department of Music, at least one numbered 7000 or higher, with grades of B+ or above, and if their overall grade average is A– or above. Applicants must demonstrate progress toward proficiency in a foreign language examined by the Department of Music.

Students in the simultaneous program fulfill the requirements for the intensive major in Music. They also take eight graduate courses in the Department of Music, with average grades of B+ or higher and grades of A or A– in at least two of the courses. They satisfy the Yale College requirements for the program (see Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees"), and they pass a departmental examination in a modern foreign language.

B.A./M.M. program The Bachelor of Arts/Master of Music program is designed for students with outstanding abilities in performance who are also interested in a liberal arts education. Admission to the B.A./M.M. program is through acceptance into Yale College as well as a separate, successful audition through the School of Music, either before matriculation into Yale College or during the third year of the B.A. program. For details regarding the B.A./M.M. program, please consult the Yale School of Music online bulletin.

Students cannot accelerate the undergraduate program in the B.A./M.M. program.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 13 term courses numbered 2000 or above (incl senior req)

Distribution of courses 2 intermediate courses and 1 advanced course from each Group I–IV

Senior requirement One-term senior essay, composition, or recital in MUSI 4996–4999

Intensive major Two-term senior essay or project in MUSI 4997–4999; additional course is supplementary to the 13 req courses

FACULTY OF THE DEPARTMENT OF MUSIC

Professors Kathryn Alexander (*Adjunct*), Richard Cohn, Daniel Harrison, Gundula Kreuzer, Richard Lalli (*Adjunct*), Ian Quinn (*Chair*), Gary Tomlinson, Michael Veal

Associate Professors Robert Holzer (*Adjunct*), Konrad Kaczmarek (*Adjunct*), Brian Kane, Markus Rathey (*Adjunct*), Braxton Shelley, Anna Zayaruznaya

Assistant Professors Ameera Nimjee, Jessica Pertiz, Lindsay Wright

Lecturers Phil Acimovic, Nathaniel Adam, Trevor Bača, Maiani da Silva, Daniel Egan, Grant Herreid, Annette Jolles, Sara Kohane, Ian MacMillen, Joshua Rosenblum, Wendy Sharp

Naval Science

Program adviser: Commander Sean Cooper (sean.cooper@yale.edu), 55 Whitney Ave., 432-8223; nrotc.yalecollege.yale.edu

The Naval Reserve Officers Training Corps (NROTC) program educates young men and women for service as commissioned officers in the United States Navy or Marine Corps. NROTC develops future officers morally, mentally, and physically, and instills in them the highest ideals of duty and loyalty and the core values of honor, courage, and commitment. The Naval Science program prepares students to assume the highest responsibilities of command, citizenship, and government.

ACADEMIC REQUIREMENTS

The Naval Science curriculum includes courses on topics such as Navy and Marine Corps organization, at-sea navigation, leadership, naval history, amphibious warfare, engineering, weapons systems, and ethics. Courses emphasize development of professional knowledge and leadership skills, which are placed in the context of military service immediately following graduation from Yale College.

Students in the NROTC program enroll in one Naval Science course per term. Most Naval Science courses count for enrollment credit only; they do not count toward the thirty-six course credits required for the Yale bachelor's degree. NAVY 2110 and NAVY 4120 do count toward graduation credit. Some courses are required for both Navy and Marine option students, while others are specific to the branch of service. All NROTC students must also enroll in the Naval Science Laboratory each term.

Navy-option students must complete eight core curriculum courses offered by Yale College: two term courses in calculus to be completed by the sophomore year, two term courses in calculus-based physics (with laboratory) to be completed by the junior year, two term courses in English or equivalent writing courses, one term course in history or national security policy, and one term course in world culture or regional studies.

Credit/D/Fail: No course taken Credit/D/Fail may be counted toward the program in Naval Science.

For Navy students, the usual sequence of Naval Science courses is:

First-Year	**Sophomore**	**Junior**	**Senior**
Introduction to Naval Science	Seapower & Maritime Affairs	Naval Engineering	Naval Operations & Seamanship
Navigation	Leadership & Management	Naval Systems	Ethics and the Profession of Arms

Marine-option students must complete three core curriculum courses offered by Yale College, including two term courses in English or equivalent writing courses, and one term course in history or national security policy.

For Marine Corps students, the usual sequence of Naval Science courses is:

First-Year	**Sophomore**	**Junior**	**Senior**
Introduction to Naval Science	Seapower & Maritime Affairs	Elective	Evolution of Warfare
Elective	Leadership & Management	Fundamentals of Maneuver Warfare	Ethics and the Profession of Arms

ADVISING AND APPLICATION TO THE PROGRAM

Application to the National Scholarship Program Eligible applicants must use the online application to complete and submit all the required information to apply for the NROTC scholarship. Applicants select either the Navy or Marine Corps option and scholarship recipients are appointed midshipmen in either the United States Naval Reserve or United States Marine Corps Reserve, as appropriate. Scholarship recipients are granted the compensation and benefits authorized by law and current policy for a total period not to exceed four years (forty months or fifty months with approved fifth year benefits). During this period, the United States government pays for college tuition, authorized academic fees, a textbook stipend, and a subsistence allowance, and provides uniforms or compensation in lieu. Upon conferral of a degree, graduates are commissioned into the Navy or Marine Corps for a minimum of five years of active duty service.

Application to the College Program Students without a scholarship who are in their first or second year may apply for enrollment in the College Program and compete for two- or three-year scholarships. If selected for the two- or three-year Scholarship Program, students receive the same benefits as students in the National Scholarship Program for their remaining undergraduate studies. Upon conferral of a degree, graduates of the College Program are commissioned into the Navy or Marine Corps for a minimum of three years of active duty service. Yale students interested in the College Program may apply directly to the Yale University NROTC Unit.

FACULTY OF THE NAVAL SCIENCE PROGRAM

Professor Captain William Johnson, USN (*Adjunct*)

Lecturers Commander Sean Cooper, USN; Captain Sumer Johnson, USMC; Lieutenant Nicholas Gioia, USN; Lieutenant Paige Miles, USN

Near Eastern Languages and Civilizations

Director of undergraduate studies: Shiri Goren (shiri.goren@yale.edu); nelc.yale.edu

The major in Near Eastern Languages and Civilizations (NELC) explores the history and cultural traditions of the ancient, classical, and modern Middle East, including northeast Africa. Students acquire proficiency in languages and skills for interpreting literature, art, and material culture from ancient Egypt and Mesopotamia; late antiquity and Classical Islam; or the contemporary moment, explored through the modern languages of Arabic, Hebrew, Persian, and Turkish. Inherently interdisciplinary, the program emphasizes analytic and reflective learning.

While the Near East is studied for its own intrinsic literary, historic, and artistic interest, as well as its cultural and historical legacies, study of a world distant in time and space also can open new ways of understanding our own. NELC majors go on to careers in government, foreign service, international finance, law, education, and even medicine and public health. The major also provides a strong foundation for graduate study and academic research.

Languages offered include: modern Arabic, Hebrew, Persian, and Turkish (including Ottoman Turkish); Classical Arabic and Classical Persian; Biblical Hebrew and ancient Assyrian & Babylonian, Egyptian, Old Persian, Syriac, and Sumerian. Students with experience in any of the modern languages must take a placement test at the beginning of the fall term. See the department website or the Center for Language Study for details.

All modern languages, as well as ancient Assyrian & Babylonian, Egyptian, and Biblical Hebrew are offered in multi-year sequences and can be taken to fulfill the foreign language requirement. The department also offers Advanced Language Certificates in Arabic, Hebrew, and Turkish; ancient Egyptian; and an interdisciplinary certificate in Persian and Iranian Studies. Many majors undertake intensive language study abroad during the summers, and the language faculty advises students on recommended programs.

COURSE NUMBERING

Courses numbered NELC 0010–0990 are first-year seminars, with enrollments capped at 18. Courses in the NELC 1000–1999 range are introductory lecture courses, and NELC 2000–2999 are seminars with enrollment capped at 18. These courses have no prerequisites and are designed for students of any background or major. Courses designated NELC 3000–3990 are more challenging and typically meet once a week. Numbers in the NELC 4000–4999 designate courses offered by visiting scholars or are courses related to the senior project.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for Near Eastern Languages and Civilizations major requirements.

The major requires twelve term courses, including the senior requirement. Working with the director of undergraduate studies (DUS), students develop coherent programs of study in one of two concentrations.

Near Eastern Languages & Civilizations Concentration (Depth) This concentration is for students who wish to focus in depth on a particular language and/or civilization, such as *ancient* Egypt or Mesopotamia; the *classical* Near East or medieval Islam; or *modern* Near Eastern culture through research conducted in modern Arabic, Hebrew, Persian, or Turkish. Contextualized through the study of literature, religion, art and archaeology, and history, this concentration enables students to study intensively a civilization of the Near East through in-depth study of one or two Near Eastern languages and written texts in their original languages.

Requirements to earn the depth concentration are 6 term courses in one or two Near Eastern languages; one NELC Foundations course; four NELC electives, chosen in consultation with the DUS (no more than two may be counted from other departments/programs); and the senior project (see below).

Near Eastern Languages, Civilizations, and Culture Concentration (Breadth) This concentration is suitable for students wishing to study the languages and civilizations of the Near East *more broadly*. It provides flexibility to study the Near East in its historical and cultural breadth, and to explore its long-lived civilizations over time or comparatively. Students in this concentration take a range of classes and, in consultation with the DUS, design their course of study according to their specific interests. Recent examples include ancient Near Eastern literature, philosophy in medieval Islam, memory and nostalgia in novels of a Soviet emigre to (the modern state of) Israel.

Requirements to earn the breadth concentration are four term courses in Near Eastern languages; two NELC Foundations courses; five NELC electives, including one on the ancient Near East, one on the medieval Near East, and one on the modern Middle East; and the senior project (see below).

Near Eastern Languages and Civilization majors are encouraged to take related courses in other departments and programs to complement their interests and round out their intellectual formation. These typically include courses in Anthropology, Archaeology, Classics, Comparative Literature, Islamic Studies, Judaic Studies, History, History of Art, History of Science, Medicine and Public Health, Philosophy, and Religious Studies. Above all, complementary courses should be chosen according to the interests of the student and in consultation with the DUS or faculty adviser. If courses outside the department include substantial Near Eastern content and are relevant to the student's overall program of study, they may be approved at the discretion of the DUS toward the elective requirement for the major. No more than two courses taken from outside the department can be counted toward fulfilling the major.

Credit/D/Fail No more than one course taken Cr/D/Fail can be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval. A maximum of two outside credits is allowed.

SENIOR REQUIREMENT

The senior requirement is an opportunity for students to design and execute an independent research project, bringing to bear their intellectual curiosity as well as

philological and analytic skills honed during their time at Yale. It is also a chance to be mentored by a member of the faculty who serves as adviser to the project, which typically culminates in an essay of about 25-35 pages (one-semester project) or 45-55 pages (year-long project). Conversations about the senior project should begin with the DUS no later than fall of junior year, especially if the student plans to undertake summer research travel.

In rare occasions and *only* with advanced written agreement of the instructor and the DUS, a research paper for an upper-level seminar may be developed and expanded to satisfy the senior requirement. In such cases, the project must constitute work substantially beyond the requirements of the seminar paper.

Each year the DUS provides majors with resources, guidelines, and for juniors and seniors, a timetable of deadlines for both the one-semester and year-long senior project. Seniors present their respective projects in a senior showcase event in April.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (including the senior req)

Distribution of courses *Near Eastern Languages & Civilizations concentration (Depth)* — 6 term courses in 1 or 2 Near Eastern languages; 1 Foundations course; and 4 electives; *Near Eastern Languages, Civilizations, and Culture concentration (Breadth)* — 4 term courses of 1 or more Near Eastern languages; 2 Foundations courses; 5 NELC electives to include 1 ancient, 1 medieval, and 1 modern

Senior requirement NELC 4920 and/or NELC 4930

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The Department of Near Eastern Languages and Civilizations offers a Certificate of Advanced Language Study in Ancient Egyptian, Arabic, Hebrew, and Turkish. A certificate adviser, typically the language program coordinator or the DUS, advises students on the certification process. The Certificate of Advanced Language Study, once completed, is listed on the student's transcript.

REQUIREMENTS FOR THE ARABIC, HEBREW, AND TURKISH CERTIFICATES

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With prior approval of the adviser, one advanced non-L5 Yale course and/or a course graded pass/fail, conducted in the target language, such as an independent study course (for Turkish certificates only), a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course taught in English to count toward the certification requirements provided the course includes at minimum a weekly discussion section conducted entirely in the target language. The discussion section must enroll a minimum of three students and the course must be designated as LxC in the course description.

The certificate adviser may also approve the substitution of up to two credits earned during study abroad and taught in the target language to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students are responsible for taking the necessary steps to ensure that those courses appear on their transcripts.

REQUIREMENTS FOR THE ANCIENT EGYPTIAN CERTIFICATE

Students seeking to earn the certificate are required to take four courses beyond the L3 level, at least two of which must be Yale courses designated as L5. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the certificate adviser, an advanced texts seminar, and/or a graduate seminar may count toward certification requirements. At the discretion of the certificate adviser, students may, with prior permission, substitute a maximum of two courses of credit-bearing academic study abroad.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of any of the certificates.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY OF THE DEPARTMENT OF NEAR EASTERN LANGUAGES AND CIVILIZATIONS

Sarab Al Ani, Victoria Almansa-Villatoro, Muhammad Aziz, Gojko Baramovic, Nicholas Brown, John Darnell, Jonas Elbousty, Ozgen Felek, Benjamin Foster, Eckart Frahm, Shiri Goren, Agnete Lassen, Gregory Marouard, Jane Mikkelson, Christopher Minkowski, Nadine Moeller, Randa Muhammed, Dina Roginsky, Emilie Sarrazin, Farkhondeh Shayesteh, Kathryn Slanski, Netta Sovinsky, Avary Taylor, Shawkat Toorawa, Kevin Van Bladel, Klaus Wagensonner, Harvey Weiss, Meryem Ezgi Yalcin, Orit Yeret

Neuroscience

Directors of undergraduate studies: Damon Clark (neuroscience.dus@yale.edu) (MCDB), YSB C148; Steve Chang (steve.chang@yale.edu) (Psychology), 100 College St.; neuroscience.yale.edu

Neuroscience aims to understand how the brain produces the mind and behavior, with the goal of advancing human understanding, improving physical and mental health, and optimizing performance. This entails a broad, interdisciplinary effort that spans from molecules to minds. At one end, biology, chemistry, and physics are improving our understanding of the molecular and cellular mechanisms of neuronal signaling and development. At the other end, psychology, psychiatry, and computer science link neural processes and systems to the mind and behavior. At all levels, the rich array of methods and data analysis depends on a strong foundation in the basic sciences, mathematics, statistics, and computer science.

PREREQUISITES

The foundational biology courses required of all Neuroscience majors are BIOL 1010, 1020, 1030, and 1040. All majors must also complete one of the following: PSYC 2100, S&DS 1030, 1050, 2300, 2380.

PLACEMENT PROCEDURES

When declaring the major, students are encouraged to send a completed Neuroscience major worksheet to the department registrar (neuroscience.registrar@yale.edu) to help with advising. We encourage all majors to take the Human Brain (NSCI 1600) and Neurobiology (NSCI 3200) as early as possible since these courses provide foundations for the NSCI curriculum and independent research.

REQUIREMENTS OF THE MAJOR

See Links to attributes indicating courses approved for Neuroscience major requirements.

A minimum of 18.5 credits is required, including the prerequisites (5 courses for 3 credits), 15 lecture or seminar courses (which include the senior requirement), and one laboratory, as follows:

1. Two Neuroscience foundation courses, NSCI 1600 and 3200.

2. One Neuroscience lab (YC NSCI Neuroscience Lab) chosen from NSCI 2280L, 2290L, 2400, NSCI 2580, 2600, 2700, 3210L; PSYC 2538.

3. Eleven electives from the following core groupings. Students may search for approved courses using the attributes indicated in each core grouping. The complete list of approved courses can be found on the NSCI website.

- minimum of 2 courses from *Systems/Circuits/Behavior Core (*YC NSCI Systems/Circuit/Behav*)*
- minimum of 2 courses from *Molecular/Cellular/Biological Core (*YC NSCI Molecular/Cell/Biol*)*
- minimum of 1 course from *Quantitative Core (*YC NSCI Quantitative*)*
- minimum of 1 course from *Computational Core (*YC NSCI Computational*)*

- minimum of 1 course from *Basic Allied Core (*YC NSCI Basic Allied Core*)*
- no more than 2 courses from *Other Allied Core (*YC NSCI Other Allied*)*

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

In addition to the course requirements described above, all students must satisfy a senior requirement undertaken during the senior year. All students must fill out a checklist of requirements and go over it with the undergraduate registrar by the spring term of the junior year.

B.S. degree program The B.S. degree program requires two-course credits of empirical research, NSCI 4900 and 4910. These courses are only available to Neuroscience seniors and receive a letter grade. Students are expected to spend at least 10 hours per week in the laboratory, to complete written assignments, and to give a presentation. In addition to time in the lab, and as part of NSCI 4900 and 4910, students are expected to attend a semi-regular capstone seminar, hear guest speakers, and discuss senior work progress with their peers and the directors of undergraduate studies (DUSs.) Research can be conducted over original, archival, or consortium data sets. Written assignments include a short research plan due at the beginning of the fall term, a grant proposal due at the end of the fall term, and a final report due at the end of the spring term. Students should pursue the same research project for two terms, with the grant proposal guiding and serving as the background for the research and final report. Seniors are also required to present their research in the spring term at a poster session. Students should find a research laboratory during the term preceding the research. Yale College does not grant academic credit for summer research unless the student is enrolled in an independent research course in Yale Summer Session. To register for NSCI 4900 and 4910, students must submit a form and the research plan with a bibliography, approved by the faculty research adviser and a DUS, by the end of the first week of classes.

B.A. degree program The B.A. degree program requires two course credits in nonempirical research, NSCI 4800 and 4810; or one credit in nonempirical research, NSCI 4800 or 4810, and one credit in empirical research, NSCI 4900 or 4910. These courses are only open to Neuroscience seniors and receive a letter grade. Under faculty supervision, for NSCI 4800 or 4810, students are required to conduct original research for at least 10 hours per week that does not involve direct interaction with data, such as developing a theory or conducting a meta-analysis to synthesize existing findings. A literature review without novel intellectual contributions is not adequate. Written assignments include a short research plan due at the beginning of the fall term, a literature review or draft theoretical paper due at the end of the fall term, and a theoretical paper due at the end of the spring term. Seniors are also required to present their research in the spring term at a poster session. To register, students must submit a form and the research plan with a bibliography, approved by the faculty adviser and a DUS, by the end of the first week of classes.

More detailed guidelines, forms, and deadline information are available on the program website.

ADDITIONAL INFORMATION

Independent research courses before senior year. The only independent research courses available to students prior to senior year are NSCI 4700, 4710. These courses are graded Pass/Fail and count toward the thirty-six credits required for the bachelor's degree, but they do not substitute for any NSCI major requirement, including the senior requirement. Independent research courses do not satisfy the lab requirement for the NSCI major. These courses are for non-Senior Neuroscience students only.

ADVISING

Due to overlap in the major course requirements, the Neuroscience major should not be combined with a second major in Molecular, Cellular and Developmental Biology or Psychology.

Program advisers Each term, students should update their Neuroscience major worksheet and then meet with their assigned faculty adviser to discuss their schedule and review their worksheet. These documents should then be submitted to the Neuroscience registrar for DUS review and approval. For questions concerning credits for courses taken at other institutions, or courses not listed in Yale Course Search, students should contact the Neuroscience registrar.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites BIOL 1010, 1020, 1030, and 1040; and one of PSYC 2100, 2300, 2380

Number of courses 18.5 credits (including prereqs and senior req)

Specific courses required 2 neuroscience foundation courses, NSCI 1600 and 3200

Distribution of courses *B.S. or B.A.*—1 lab course; 11 electives including at least: 2 Systems/Circuits/Behavior Core courses, 2 Molecular/Cellular/Biological Core courses, 1 Quantitative Core course, 1 Computational Core course, 1 Basic Allied Core course, and no more than 2 Other Allied Core courses

Senior requirement *B.S.*—2 empirical research courses, NSCI 4900 and 4910; *B.A.*—2 nonempirical research courses, NSCI 4800 and 4810, or 1 empirical research course (NSCI 4900 or 4910) and 1 nonempirical research course (NSCI 4800 or 4810)

FACULTY OF THE NEUROSCIENCE MAJOR

Professors †Amy Arnsten (*School of Medicine, Psychology*), Ty Cannon (*Psychology*), John Carlson (*Molecular, Cellular, and Developmental Biology*), Marvin Chun (*Psychology*), Damon Clark (*Molecular, Cellular, and Developmental Biology*), Thierry Emonet (*Molecular, Cellular, and Developmental Biology*), Jutta Joormann (*Psychology*), Douglas Kankel (*Molecular, Cellular, and Developmental Biology*), Haig Keshishian (*Molecular, Cellular, and Developmental Biology*), †John Krystal (*School of Medicine, Psychology*), Rajit Manohar (*Electrical Engineering*), †Linda Mayes (*School of Medicine, Psychology*), Greg McCarthy (*Psychology*), Wendy Mendes (*Psychology*), Kia Nobre (*Psychology*), Laurie Santos (*Psychology*), †Dana Small (*School of Medicine, Psychology*), †Jane Taylor (*School of Medicine, Psychology*), Nick Turk-Browne (*Psychology)*

Associate Professors Arielle Baskin-Sommers (*Psychology*), Abhishek Bhattacharjee (*Computer Science*), †Sreeganga Chandra (*School of Medicine, Molecular, Cellular, and Developmental Biology*), Steve Chang (*Psychology*), †Philip Corlett (*School of Medicine, Psychology*), Dylan Gee (*Psychology*), Smita Krishnaswamy (*Genetics*), †Ifat Levy (*School of Medicine, Psychology*), †James McPartland (*School of Medicine, Psychology*), Weimin Zhong (*Molecular, Cellular, and Developmental Biology*)

Assistant Professors Maria Gendron (*Psychology*), Randolf Helfrich (*Psychology*), Julia Leonard (*Psychology*), Samuel McDougle (*Psychology*), Harry McNamara (*Molecular, Cellular, and Developmental Biology*), Michael O'Donnell (*Molecular, Cellular, and Developmental Biology*), Priya Panda (*Electrical Engineering*), Robb Rutledge (*Psychology*), Shreya Saxena (*Biomedical Engineering*), Ilker Yildirim (*Psychology*)

Lecturer Stephanie Lazzaro (*Psychology*)

†A joint appointment with a primary affiliation in another department or school.

Persian and Iranian Studies Certificate

Certificate director: Samuel Hodgkin (samuel.hodgkin@yale.edu)

This certificate recognizes the work of undergraduates who combine the study of Persian language and literature with a wider engagement with the art, philosophy, religion, history, politics, and culture of the Persian-speaking world. Students seeking to earn the certificate will develop a strong sense of community with peers interested in this area of study. These students will typically fall into three categories: 1) non-humanities majors (and pre-meds) with a strong interest in Persian and Iranian studies; 2) social science and humanities majors in non-NELC departments wishing to formalize their particular focus on Iran or Persian culture; and 3) Persian heritage students and students of Turkish, South Asian, Armenian, Central Asian, or other post-Persianate cultural backgrounds, for whom the certificate provides a way for them to explore their heritage.

REQUIREMENTS

See the Link to the YC Persia & Iran Content attribute indicating courses approved for certificate requirements.

Students must successfully complete 5 course credits and attend 3 events. Events include, but are not limited to Iran Colloquium lectures, sessions of Persian Circle, or screenings of Persian-language films by the language program. Students submit a 1–2 page write-up about each event to the certificate director. Events will be announced through the Certificate email list and will appear on the CMES events calendar.

Courses are drawn from a list of approved courses and must be taken for a letter grade of B or above. The 5 required courses are divided between 3 content courses and 2 language courses. Courses that do not appear on the approved list may be approved by permission of the certificate director.

The content courses are concerned with the art, philosophy, religion, history, politics, and culture of the Persian-speaking world, and are identified by the attribute, YC Persia & Iran Content in Yale Course Search. Only two content courses should originate in the same department. Courses in premodern Iranian languages (e.g. Old Persian, Middle Persian, Soghdian) are content courses. All Persian L5 courses are content-oriented and can be counted either as a content course or a language course.

To complete the language requirement, students must complete two courses in Persian language (L1-L5).

Graduate and professional school courses may count toward the certificate. No more than two course credits fulfilling the requirements of the Persian and Iranian Studies Certificate may overlap with a major, a simultaneous degree, or another certificate. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the certificate.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval

DECLARATION OF CANDIDACY

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Number of courses 5 course credits

Distribution of courses 3 content courses and 2 language courses

Additional requirements attendance of 3 events, and submission of a 1–2 page write-up for each

Philosophy

Director of undergraduate studies: Daniel Greco (daniel.greco@yale.edu); (daniel.greco@yale.edu)philosophy.yale.edu

The Philosophy major prepares students to reflect critically and creatively on questions concerning the nature of things, the scope and limits of human understanding, and the principles of value and right action. The major aims to address these questions wherever they arise, whether in the philosophical tradition, in other disciplines and practices, or in everyday life. Our courses are designed to encourage depth in thinking, rigor in argument, clarity in writing and speaking, and the widest possible view of whatever subject matter we take up.

COURSE NUMBERING

Courses numbered with the initial digit 0 are first-year seminars and have no prerequisites. Courses with the initial digit 2 are intermediate-level courses. Some have prerequisites; others do not and may be taken as a student's first course in philosophy, though such a student should consult the instructor first. In general, it is a good idea to take a broadly based course in any area of philosophy before taking a specialized course. Courses numbered with initial digits 3 and 4 are advanced and are taught as limited enrollment seminars. These courses are intended primarily for juniors and seniors, though other students may be admitted with the instructor's permission. Undergraduates should be sure they have enough background to take such a course, including previous work in the same area of philosophy.

PREREQUISITES

Prerequisite to the standard major are two introductory or intermediate philosophy courses. Prerequisite to the concentration in psychology are two introductory or intermediate courses in philosophy or psychology.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Philosophy major requirements.

The Philosophy curriculum is divided into three broad groups: history of philosophy; metaphysics and epistemology; and ethics and value theory (See Course Attributes). The group to which a course belongs is indicated in Yale Course Search (YCS). This information is found in the "course information" section of each course listing. Students can search for courses satisfying a given group requirement in YCS by clicking the drop-down menu titled, "Any Course Information Attribute."

The standard major requires twelve term courses (including the prerequisites and the senior requirement) that collectively expose students to a wide range of philosophy and philosophers. In the history of philosophy group, majors are required to take (1) PHIL 1125 and PHIL 1126 (DRST 0003 and DRST 0004 can substitute for PHIL 1125 and 1126), and (2) an additional, third course in history of philosophy. Majors are encouraged to take PHIL 1125 and PHIL 1126 as early as possible; these courses may be taken in either order. Majors must also complete two courses in metaphysics and epistemology, two courses in ethics and value theory, and a course in logic (such as PHIL 1115), the last preferably by the fall of their junior year. Majors

must also take two advanced seminars at the 3000+ level (either or both of which can be counted toward one of the group requirements) and satisfy the senior requirement as described below.

All courses in Philosophy count toward the twelve-course requirement. With approval from the director of undergraduate studies (DUS), courses offered by other departments may be counted toward the major requirements, though no more than two such courses will normally be allowed.

Specific regulations for the group requirements are as follows:

1. Some introductory courses do not count toward any group requirement.
2. Courses automatically count toward the group under which they are listed in Yale Course Search (YCS). In rare cases, a course will be designated as counting toward a second group, although no one course can be counted toward two group requirements. Students may petition to have a course count toward a group other than the one under which it is listed, though the presumption will be against such petitions.
3. Courses taken in other departments and applied to the major will not normally count toward a group requirement. Students may petition for credit toward a group requirement, though the presumption will be against such petitions.

The psychology concentration The psychology concentration is designed for students interested in both philosophy and psychology. Majors in the concentration must take seven courses in philosophy and five in psychology, for a total of twelve, including the prerequisites and senior requirement. The seven philosophy courses must include (1) two courses in the history of philosophy, usually PHIL 1125 and PHIL 1126 or DRST 0003 and DRST 0004, (2) a course in logic, such as PHIL 1115, preferably by the fall of the junior year, (3) two seminars, one of which may be in the Psychology department, with the approval of the DUS, and (4) at least two courses at the intermediate or advanced level that bear on the intersection of philosophy and psychology, at least one of which must be a philosophy seminar. Courses satisfying (4) must be approved by the DUS. The five psychology courses must include PSYC 1100 or its equivalent. Each major must also satisfy the senior requirement as described below.

Credit/D/Fail At most one class taken Credit/D/Fail can count toward the requirements of the major. Courses taken Credit/D/Fail cannot fulfill any specific distribution requirements within the major—they cannot fulfill the group requirements, the seminar requirement, the senior requirement, or (on the psychology track) the intersection requirement. But if all those requirements are fulfilled with classes taken for a letter grade, then one of the remaining 12 total credits may be fulfilled with a class taken Credit/D/Fail, however, that course will count as a non-A grade when calculating for distinction in the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The senior requirement is normally satisfied by completing a third philosophy seminar. Students taking a seminar to satisfy the senior requirement are expected to produce

work superior in argument and articulation to that of a standard seminar paper. To this end, students taking a seminar for the senior requirement must satisfy additional requirements, which may include (1) additional readings, (2) submission of a complete draft of the final paper by the eighth week of the term that will then be significantly revised, and (3) one-on-one or small-group meetings with the instructor to discuss class material, the additional readings, and drafts in preparation. The specific nature of these additional requirements will vary from seminar to seminar. Students planning to satisfy the requirement with a third seminar should express that intention to the instructor at the beginning of the term, so the instructor can explain the work that will be required.

In special cases, students may meet the senior requirement through either a one-term or a two-term independent project supervised by an instructor (PHIL 4490, PHIL 4491). Students must petition to fulfill the senior requirement through an independent project, and approval is not guaranteed. Applicants must submit a proposal to the DUS, in consultation with an appropriate supervisor, by the end of the term prior to beginning the independent study.

ADVISING

By default, advising in the philosophy department is done by the DUS. Juniors have the option of selecting an alternative adviser—which should be done by the first of October in the junior year—but all seniors are advised by the DUS. The adviser aids students in choosing courses.

Other majors involving philosophy Majors in Mathematics and Philosophy and in Physics and Philosophy are also available. Students interested in philosophy and psychology should also consider the major in Cognitive Science.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites *Standard major*—2 intro or intermediate phil courses; *Psychology concentration*—any 2 courses in phil or psych

Number of courses 12 term courses, incl prereqs and senior req

Specific courses required *Standard major*—PHIL 1125 and PHIL 1126, or DRST 0003 and DRST 0004; *Psychology concentration*—PSYC 1100 or equivalent

Distribution of courses *Standard major*—3 courses in hist of phil (incl PHIL 1125 and PHIL 1126, or DRST 0003 and DRST 0004), 2 in metaphysics and epistemology, 2 in ethics and value theory, and 1 in logic; 2 phil sems at 3000+ level; *Psychology concentration*—7 courses in phil, as specified; 5 courses in psych (incl PSYC 1100)

Substitution permitted 2 related courses in other depts, with DUS permission

Senior requirement a third sem in phil, or a one- or two-term independent project (PHIL 4490, PHIL 4491)

FACULTY OF THE DEPARTMENT OF PHILOSOPHY

Professors Stephen Darwall, Michael Della Rocca, Keith DeRose, Paul Franks, Tamar Gendler, Robert Gooding-Williams, Daniel Greco, Verity Harte, Brad Inwood, Shelly Kagan, Joshua Knobe, LA Paul, Thomas Pogge, Scott Shapiro, Sun-Joo Shin, Steven Smith, Jason Stanley, Zoltán Szabó, Gideon Yaffe

Associate Professors Tim Clarke, Robin Dembroff, John Pittard

Assistant Professors Tyler Brooke-Williams, Claudia Dumitru, Lily Hu, Jacob McNulty

Physics

Director of undergraduate studies: David Poland (david.poland@yale.edu); physics.yale.edu/academics/undergraduate-studies

The overarching goal of the physics program is to train students—majors and nonmajors alike—to think like physicists, the hallmarks of which include: striving for fundamental explanations that have broad predictive power; appreciating that quantitative analysis is necessary for proper understanding; simplifying physical situations to their essentials to enable the development of mathematical models to explain and predict experimental data; and comparing experimental data from the natural world to theory.

To achieve this goal, we offer courses for physics majors who intend to further their study of physics or any STEM field in graduate school, as well as those physics majors who intend to go into law, consulting, financial services, technology industries, teaching, or any number of fields. Many students enroll in our introductory courses as a compulsory requirement of their STEM major; to satisfy a requirement for admission into medical school; or because they appreciate the quantitative training and intrinsic value offered by a basic understanding of modern physics. The director of undergraduate studies (DUS) can help students prepare for graduate school in physics by recommending appropriate electives to supplement the core courses. Research experience (PHYS 2710, 2720, 4710, and 4720) is an important aspect of preparing for graduate school.

The department offers two majors in Physics: the B.S. and the B.S. intensive major. Students in either program acquire advanced training in physics, mathematics, and related topics through the core courses. They use electives to design individualized programs with more depth or breadth, depending on their interests. Both degree programs require some research experience. PHYS 2710 and PHYS 2720, introductory research courses, are open to all students. Juniors and seniors, as part of the senior requirement, are required to enroll in PHYS 4710 and 4720—one term for the B.S. degree and two terms for the B.S. degree, intensive major. Combined majors are available in Mathematics and Physics, Astrophysics, Physics and Philosophy, and Physics and Geosciences.

COURSES FOR NONMAJORS AND MAJORS

A guide to selecting physics courses is available to aid in course selection. Questions about placement should be addressed to the DUS.

Introductory courses with no calculus requirement Physics courses numbered 1200 or below are for students with little or no previous experience in physics who do not plan to major in the natural sciences. Many of these courses fulfill the science and/or quantitative reasoning distributional requirements. These courses have no college-level mathematics requirement and do not satisfy the medical school requirement.

Introductory calculus-based lecture sequences

1. PHYS 1700, 1710 is aimed at students who are interested in the biological sciences or medicine. Knowledge of differential and integral calculus at the level of MATH 1120 or equivalent is a prerequisite. MATH 1150 or (preferably)

MATH 1160 should be taken concurrently with PHYS 1710. PHYS 1700 is a prerequisite for PHYS 1710.

2. PHYS 1800, 1810 is aimed at students who plan to major in the physical sciences or engineering. Calculus at the level of MATH 1120 is a prerequisite; MATH 1150 and MATH 1200 should be taken concurrently. PHYS 1800 or PHYS 2000 is a prerequisite for PHYS 1810.
3. PHYS 2000, 2010 is aimed at students with a strong background in mathematics and physics who plan to major in the physical sciences. Calculus at the level of MATH 1150 is presumed; MATH 1200 and either MATH 2220, MATH 2250, or MATH 2260, which are generally taken concurrently.
4. PHYS 2600, 2610 is intended for students who have had excellent prior training in mathematics and a solid foundation in physics. One of MATH 1200, ENAS 1510, PHYS 4000, or the equivalent should be taken concurrently with PHYS 2600, 2610. Students considering an alternative MATH course should check with the DUS in Physics.

Introductory laboratories Two different introductory laboratory sequences are offered: PHYS 1650L, 1660L, and PHYS 2050L, 2060L. Each of these laboratory courses earns one-half course credit. Students normally take the laboratory courses associated with the introductory physics sequence in which they are enrolled.

1. PHYS 1650L, 1660L is an introductory laboratory sequence aimed at students interested in engineering, the life sciences, and medicine. Related lecture courses are PHYS 1700, 1710, and PHYS 1800, 1810.
2. PHYS 2050L, 2060L is for students who plan to major in the physical sciences or engineering. Related lecture courses are PHYS 1800, 1810; PHYS 2000, 2010; and PHYS 2600, 2610. Students who take the lecture courses in their first year are advised to start this laboratory sequence with PHYS 2050L in the spring of their first year or in the fall of sophomore year.

Advanced electives A series of 3400-level electives explores special topics of interest to both majors and nonmajors. The electives are open to any student in Yale College who has completed a year of introductory calculus-based physics (PHYS 1700, 1710; or PHYS 1800, 1810; or PHYS 2000, 2010; or PHYS 2600, 2610). Physics courses numbered 3000 or higher count as electives for the major.

PREREQUISITES

B.S. degree program The prerequisites include an introductory lecture course sequence with a mathematics sequence equivalent to, or more advanced than, the corequisite of the physics sequence. The following options are appropriate: PHYS 1700, 1710 with MATH 1120, MATH 1150; or PHYS 1800, 1810 with MATH 1150, MATH 1200; or PHYS 2000, 2010 with MATH 1200 and either MATH 2220 or MATH 2250 or MATH 2260; or PHYS 2600, 2610 with MATH 1200, ENAS 1510, PHYS 4000, or equivalent. In addition, the laboratory course PHYS 2050L or the sequence PHYS 1650L, 1660L is required. Students who take these physics and mathematics courses starting in their first year may satisfy the prerequisites by the middle of their sophomore year. Students who begin taking physics courses in their sophomore year may also complete either the

standard or the intensive major. Students are advised to take mathematics courses throughout their first year at the appropriate level.

B.S. degree program, intensive major The prerequisites for the B.S. degree with an intensive major are the same as for the standard program.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2025–2026, may be fulfilled by students who declared the major in a prior term.

B.S. degree program Eight and one-half course credits are required beyond the prerequisites, including the senior project. Students must take a mathematics course at the level of, or more advanced than, PHYS 4000. Three courses at the core of the major, PHYS 4010, 4020, and either PHYS 4390 or 4400, involve advanced study of fundamental topics common to all branches of physics. PHYS 4010 and 4020 pertain to advanced classical physics (mechanics, statistical physics and thermodynamics, and electromagnetism), while the third, PHYS 4390 or 4400 covers quantum mechanics. PHYS 4010 must be taken before PHYS 4020, 4390, or 4400.

Because experiment is at the heart of the discipline, the major requires at least one laboratory course (PHYS 2060L or equivalent) and at least one term of independent research (PHYS 4710, 4720 or equivalent). Three advanced elective courses are also required. Suitable advanced courses are numbered 3000 or higher, such as the advanced laboratory PHYS 4450L, and 4000-level courses in Physics. Students may also find suitable advanced courses in other departments in the sciences, engineering, and mathematics. Courses taken to satisfy these requirements must be approved by the DUS. In order to pursue their individual interests in sufficient depth, many students choose to take more than the required number of advanced courses.

B.S. degree program, intensive major Ten and one-half course credits are required beyond the prerequisites, including the senior project. Students must take a mathematics course at the level of, or more advanced than, PHYS 4000. Five courses at the core of the major involve advanced study of fundamental topics common to all branches of physics. Three of the courses pertain to advanced classical physics: mechanics (PHYS 4100), statistical physics and thermodynamics (PHYS 4500), and electromagnetism (PHYS 4300). Two other courses incorporate quantum mechanics (PHYS 4390 or 4400 and PHYS 4410). Because the ideas build progressively: PHYS 4100 must precede PHYS 4390 or 4400; PHYS 4300 and PHYS 4390 or 4400 must precede PHYS 4410, and PHYS 4390 or 4400 must also precede or (with instructor permission) be taken concurrently with PHYS 4500.

Because experiment is at the heart of the discipline, the intensive major requires two laboratory courses (PHYS 2060L and PHYS 4450L or equivalent) and at least two terms of independent research (PHYS 4710, 4720 or equivalent). One advanced elective course is required to complete the program. Suitable advanced courses are numbered 3000 or higher, and include 4000-level courses in Physics. Students may also find suitable advanced courses in other departments in the sciences, engineering, and mathematics. Courses taken to satisfy these requirements must be approved by the

DUS. In order to pursue their individual interests in sufficient depth, many students choose to take more than the required number of advanced courses.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of either major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

B.S. degree program The senior requirement for the standard B.S. degree is fulfilled by receiving a passing grade on a one-term research project in PHYS 4710 or 4720 or equivalent. One enrollment of PHYS 4710 or 4720 taken at any time during junior or senior year counts as the senior requirement for the Physics major. Students should consult the DUS for further information.

B.S. degree program, intensive major The senior requirement for the intensive major is fulfilled by receiving a passing grade on a two-term research project (or two one-term research projects) in PHYS 4710 or 4720. Two enrollments of PHYS 4710 or 4720 taken at any time during junior or senior year counts as the senior requirement for the intensive Physics major. Students may take either PHYS 4710 or 4720 two times or they can take each course one time. Students should consult the DUS for further information.

ADVISING

All Physics majors in the sophomore, junior, and senior classes must have their programs approved by the DUS. First-year students and undeclared sophomores who are interested in Physics or related majors are encouraged to meet with the DUS to discuss their questions and proposed programs.

For both the standard B.S. degree and the B.S. degree with an intensive major, students are advised to begin the program in their first year to allow the greatest amount of flexibility in course selection. It is possible, however, to complete either program in a total of six terms, as illustrated below.

A program for a student completing the Physics B.S. in three years might be:

First-Year or Sophomore	**Sophomore or Junior**	**Senior**
PHYS 1700, 1710, or PHYS 1800, 1810, or PHYS 2000, 2010, or PHYS 2600, 2610	PHYS 2060L	PHYS 4390 or PHYS 4400
PHYS 2050L	PHYS 4000	PHYS 4710 or 4720
Mathematics corequisites	PHYS 4010	Two advanced electives
	PHYS 4020	
	One advanced elective	

A program for a student completing the intensive major in three years might be:

First-Year or Sophomore	Sophomore or Junior	Senior
PHYS 1700, 1710, or PHYS 1800, 1810, or PHYS 2000, 2010, or PHYS 2600, 2610	PHYS 2060L	PHYS 4450L
PHYS 2050L	PHYS 4000	PHYS 4400
Mathematics corequisites	PHYS 4100	PHYS 4500
	PHYS 4300	PHYS 4410
	One advanced elective	PHYS 4710
		PHYS 4720

SUMMARY OF MAJOR REQUIREMENTS

B.S. DEGREE

Prerequisites PHYS 1700, 1710 or PHYS 1800, 1810 or PHYS 2000, 2010 or PHYS 2600, 2610, with appropriate math coreqs, as indicated; PHYS 2050L or PHYS 1650L, 1660L

Number of courses 9 term courses for 8.5 course credits beyond prereqs (incl senior req)

Specific courses required PHYS 4010, 4020, and either PHYS 4390 or 4400, as indicated; PHYS 2060L or equivalent

Distribution of courses PHYS 4000 or other advanced math course; 3 advanced electives approved by DUS

Senior requirement One term of PHYS 4710 or 4720 or equivalent

B.S. DEGREE, INTENSIVE MAJOR

Prerequisites PHYS 1700, 1710 or PHYS 1800, 1810 or PHYS 2000, 2010 or PHYS 2600, 2610, with appropriate math coreqs, as indicated; PHYS 2050L or PHYS 1650L, 1660L

Number of courses 11 term courses for 10.5 course credits beyond prereqs (incl senior req)

Specific courses required PHYS 4100, 4300, PHYS 4390 or 4400, 4410, 4500, as indicated; PHYS 2060L and PHYS 4450L or equivalent

Distribution of courses PHYS 4000 or other advanced math course; 1 advanced elective approved by DUS

Senior requirement Two terms of PHYS 4710 or 4720 or equivalent

FACULTY OF THE DEPARTMENT OF PHYSICS

Professors †Charles Ahn, Yoram Alhassid, Thomas Appelquist, †Charles Bailyn, O. Keith Baker, Charles Baltay (*Emeritus)*, Sean Barrett, †Joerg Bewersdorf, Helen Caines, †Hui Cao, Richard Casten (*Emeritus*), †Damon Clark, †Paolo Coppi, Sarah Demers, †Thierry Emonet, †Marla Geha, Steven Girvin, Larry Gladney, Leonid Glazman, Walter Goldberger, Jack Harris, John Harris (*Emeritus*), Karsten Heeger,

†Joe Howard, Francesco Iachello (*Emeritus*), †Sohrab Ismail-Beigi, Steve Lamoreaux, Konrad Lehnert, †Andre Levchenko, Reina Maruyama, Simon Mochrie, Vincent Moncrief, †John Murray, Daisuke Nagai, †Priyamvada Natarajan, †Andrew Neitzke, †Vidvuds Ozolins, Peter Parker (*Emeritus*), †Daniel Prober, Nicholas Read, †Robert Schoelkopf, †John Schotland, †Jurgen Schukraft, Ramamurti Shankar, Witold Skiba, †A. Douglas Stone, †Hong Tang, Paul Tipton, C. Megan Urry, †Frank van den Bosch, †Pieter van Dokkum, †John Wettlaufer, Michael Zeller (*Emeritus*)

Associate Professors †Michael Murrell, Nir Navon, Laura Newburgh, †Corey O'Hern, Nikhil Padmanabhan, David Poland, †Peter Rakich, Alison Sweeney

Assistant Professors Charles Brown, Meng Cheng, Laura Havener, †Yu He, Eduardo Higino da Silva Neto, Christopher Lynn, Benjamin Machta, †Owen Miller, Chiara Mingarelli, David Moore, Ian Moult, †Shruti Puri, †Diana Qiu, †John Sous, †Logan Wright

Senior Lecturer Adriane Steinacker

Lecturers †Eun-Joo Ahn, Mehdi Ghiassi-Nejad, Caitlin Hansen, Stephen Irons, Stephen Konezny, Rona Ramos, †Barbara Cruvinel Santiago

†A joint appointment with primary affiliation in another department.

Physics and Geosciences

Directors of undergraduate studies: David Poland (dus.physics@yale.edu) (Physics); Pincelli Hull (pincelli.hull@yale.edu) (Earth and Planetary Sciences)

The major in Physics and Geosciences applies fundamental physical principles to the study of the Earth and other planetary bodies, synthesizing concepts and methods from both the Physics majors and the Earth and Planetary Sciences majors.

PREREQUISITES

The prerequisites for the major include MATH 1200 or its equivalent, PHYS 1700, PHYS 1710 or another introductory physics sequence, the physics laboratory course PHYS 2050L, and a course in ordinary differential equations chosen from ENAS 1940, MATH 2460, or PHYS 4000.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2025–2026, may be fulfilled by students who declared the major in a prior term.

Beyond the prerequisites, the major requires twelve and a half course credits (thirteen course credits if the EPS introductory course has an accompanying laboratory), including the senior project. At least four and a half of these course credits must be in Physics and at least six must be in Earth and Planetary Sciences. Students complete PHYS 2060L and a two- or three-term advanced physics sequence: either PHYS 4010 and PHYS 4020, or PHYS 4100, PHYS 4500, and PHYS 4300. They must also take basic quantum mechanics (PHYS 4390 or PHYS 4400) and one elective numbered PHYS 3000 or above. Relevant classes in related departments may be substituted with the permission of the DUS in Physics. Required courses in Earth and Planetary Sciences include one introductory course numbered EPS 1000–1400, with any accompanying laboratory; one elective numbered EPS 2000 or above; and four advanced electives from one of two EPS tracks: the Atmosphere, Ocean, and Climate track or the Solid Earth Science track. Relevant classes in related departments may be substituted with the permission of the DUS in Earth and Planetary Sciences. No elective course may count toward multiple requirements for the major.

Credit/D/Fail No course taken Credit/D/Fail may be counted toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students complete a two-term senior project on a topic that is appropriate for the combined major and acceptable to both the Physics and the Earth and Planetary Sciences departments. The project is undertaken in either PHYS 4710 and 4720 or EPS 4900 and EPS 4910. In addition, students must present an oral report on their project to each department.

ADVISING

Interested students should consult the directors of undergraduate studies (DUSs) in Physics and in Earth and Planetary Sciences.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites MATH 1200 or equivalent; PHYS 1700, PHYS 1710 or above; PHYS 2050L; 1 of ENAS 1940, MATH 2460, or PHYS 4000

Number of courses At least 12.5 course credits beyond prereqs, incl senior req

Specific courses required PHYS 2060L; PHYS 4010 and PHYS 4020, or PHYS 4100, PHYS 4500, and PHYS 4300; PHYS 4390 or PHYS 4400

Distribution of courses 1 elective numbered PHYS 3000 or above; 1 intro course in EPS 1000–1400, with lab, as specified; 1 elective course numbered EPS 2000 or above; 4 advanced courses in an EPS track, as specified

Substitution permitted Courses in related departments for PHYS elective and EPS electives with DUS permission

Senior requirement Senior project in PHYS 4710 and 4720 or EPS 4900 and EPS 4910, on topic acceptable to both depts; oral report on project to both depts or equivalent

Physics and Philosophy

Directors of undergraduate studies: David Poland (david.poland@yale.edu) (Physics), Daniel Greco (daniel.greco@yale.edu) (Philosophy)

PREREQUISITES

Prospective majors in Physics and Philosophy are advised to begin taking the prerequisites during their first year, and to take at least two of the required philosophy courses by the end of their sophomore year. Prerequisites for this major are as follows: mathematics through calculus at the level of MATH 1200; any introductory physics lecture sequence PHYS 1700, 1710 or higher; PHYS 1650L and 1660L, or PHYS 2050L.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2025-2026, may be fulfilled by students who declared the major in a prior term.

Beyond the prerequisites, students take fifteen courses for fourteen and a half course credits, including the senior requirement. The laboratory course PHYS 2060L and seven advanced courses in physics approved by the director of undergraduate studies (DUS) numbered 3000 or higher are required, including PHYS 4000 or equivalent, and either PHYS 4390 or 4400. Six courses in Philosophy or in History of Science, Medicine, and Public Health are required, including PHIL 1125 and PHIL 1126, one course in logic above the introductory level, and a philosophy seminar selected with the approval of the DUSs.

Credit/D/Fail At most, one course taken Credit/D/Fail may be applied toward the major, with permission of the DUSs. Physics courses must be taken for a letter grade to count towards the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

B.S. degree program Seniors must complete PHYS 4710 and/or 4720, only one of which may count toward the eight required physics courses.

B.A. degree program Seniors must complete one of the following: (1) PHIL 4490 or PHIL 4491 (senior essay); (2) PHIL 4480 (tutorial) on an appropriate subject; (3) an appropriate philosophy seminar with the approval of the DUS in Philosophy.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites MATH 1200; PHYS 1700, 1710, or higher; PHYS 1650L and 1660L, or PHYS 2050L

Number of courses 15 courses for 14.5 course credits beyond prereqs, incl senior req

Specific courses required PHYS 2060L; PHYS 4000 or equivalent; PHYS 4390 or 4400; PHIL 1125, PHIL 1126

Distribution of courses 5 addtl physics courses numbered 3000 or higher approved by DUS; 4 addtl courses in PHIL or HSHM, incl 1 in logic above intro level and a PHIL sem, as specified

Senior requirement *B.S.*—PHYS 4710 and/or 4720 (only one of which may count toward the 8 required physics courses); *B.A.*—PHIL 4490 or PHIL 4491, PHIL 4480 on appropriate topic, or approved PHIL sem

Political Science

Directors of undergraduate studies: Andrea Aldrich (andrea.aldrich@yale.edu); politicalscience.yale/edu

Political science addresses how individuals and groups organize, allocate, and challenge the power to make collective decisions involving public issues. The goal of the major is to enable students to think critically and analytically about the agents, incentives, and institutions that shape political phenomena within human society. The subfields of political philosophy and analytical political theory (which includes the study of both qualitative and quantitative methodology) support the acquisition of the lenses through which such thought skills can be enriched. The subfields of American government, comparative politics, and international relations, in turn, allow students to reinforce and refine those skills, while also promoting their application to a wide variety of contexts, whether contemporary or historical. Students may also construct interdisciplinary curricula, which allows them to apply the approaches of the discipline to a topic for which a more complete understanding also involves approaches gleaned from other disciplines.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for Political Science major requirements.

Students following the standard B.A. degree program must take twelve term courses. These courses include: at least two introductory courses (i.e designated with a 1 as the first digit); at least one course designated as belonging to the methodology and formal theory subfield; at least two non-introductory lectures designated as "core;" at least two classes in each of any two of the department's subfields (other than methodology and formal theory)—international relations, American government, political philosophy, and comparative politics; at least two seminars, including at least one during their senior year.

All students may also take courses related to political science that are offered by other departments. Students who elect the standard program may petition to count up to two such courses toward the major. Students may routinely count Residential College Seminars taught by members of the Political Science faculty toward the major, and they may petition to count one Residential College Seminar taught by an instructor outside the department. Students who have completed Directed Studies may, with the approval of the DUS, count one term of DRST 0005 or DRST 0006 toward the major.

Students following the standard B.A. degree program, interdisciplinary concentration are allowed to identify and pursue an area of study that crosses conventional disciplinary and departmental boundaries. Examples of interdisciplinary concentrations include (but are not limited to) urban studies, health politics and policy, political economy, political psychology, or a focus on the politics of a given global region informed by the study of the history and society of that region. Students choosing an interdisciplinary concentration are required to take twelve term courses toward the major. At least seven courses must be in the field of concentration. Of the courses counting toward the major outside of the field of concentration, at least two courses must be taken in each of any two of the department's five fields. As many as

three courses taken in other departments may be counted toward the major, with the permission of the DUS. *Note:* students who choose the interdisciplinary concentration must fulfill the introductory course requirement, the core lecture requirement, the methodology and formal theory subfield requirement, and the seminar requirement as described for the standard degree program.

Students wishing to pursue the Political Science major with an interdisciplinary concentration must submit an application, which is due prior to the beginning of the November recess in the student's final year of enrollment. Students should also meet with the DUS to discuss their proposed program of study in their sophomore or junior year.

The intensive major The intensive major allows students to undertake more extensive coursework and research for the senior essay than is possible in the standard major. Requirements for the intensive major are identical to those for the standard program or interdisciplinary concentration, with the following exceptions: (1) in the spring term of the junior year, intensive majors take PLSC 4900 in preparation for writing a yearlong senior essay; (2) in the senior year, intensive majors fulfill the senior essay requirement by enrolling in the yearlong course sequence PLSC 4901 and PLSC 4903.

Juniors wishing to pursue an intensive major must apply to the DUS. The application should contain: (1) the intensive major application form signed by a faculty adviser who has agreed to supervise the student for the final three terms of enrollment; (2) a plan of study that identifies the political science courses that will be taken in those three terms; and (3) a one-page description of the proposed senior essay.

Seminar requirement Students majoring in Political Science are required to take at least two seminars taught by members of the Political Science department, including at least one during the senior year.

Credit/D/Fail Students may count up to two lecture courses taken Credit/D/Fail toward the requirements of the major. Seminars taken Credit/D/F do not count toward the major requirements.

SENIOR REQUIREMENT

Seniors in the major have two options for completing the senior essay. All students may complete the requirement with an essay in a senior seminar. Students pursuing honors in the major must complete an honors senior essay. In order to graduate from Yale College, a student majoring in Political Science must achieve a passing grade on the essay.

Honors essays can be written either in one term or over both terms of the senior year. **Honors senior essay eligibility** will be granted to students who have current GPA of 3.7 in all PLSC courses where a letter grade is awarded and they have completed the following requirements of the major: two introductory level courses, one core lecture course, one seminar with a member of the Political Science department, and a methodology course. An application form for the honors essay must signed by a faculty advisor and the requirements listed above must be met or in progress at the time of application.

Senior essay The senior essay provides an appropriate intellectual culmination to the student's work in the major and in Yale College. The essay should ordinarily be written

on a topic in an area in which the student has previously done coursework, and an effort should be made to demonstrate how the student's work relates to broader topics, issues, and approaches within the discipline of political science. It should rest on research that is appropriate to the subject matter and should reflect an awareness of how the student's topic is connected to previous work within the discipline of political science. Essays are expected to be in the range of 25–30 double-spaced pages. At the time a student applies to pursue the honors essay, students must have their senior essay topic approved by a faculty member who has agreed to advise them. Each student is expected to consult regularly with the seminar instructor or adviser and take the initiative in developing a plan of research, scheduling regular meetings, and submitting preliminary drafts for review.

One-term essays may be written either in a seminar or, with the approval of an adviser and the DUS, in PLSC 4900. More extensive information about the senior essay can be found on the department website.

Yearlong senior essay Students who wish to undertake a more extensive research project than is possible in a single term may fulfill the senior essay requirement by enrolling in the yearlong course sequence PLSC 4900 and PLSC 4901. Both classes are offered in both terms, but must be taken in order. PLSC 4900 also counts toward the senior seminar requirement. In the first term, students writing a yearlong senior essay develop a research prospectus for the essay and begin their research under the supervision of a member of the faculty who specializes in the area being investigated. In the second term, students complete the essay. Yearlong senior essays are expected to be substantially longer than a regular term paper. While there is no fixed length, they are normally at least fifty pages long.

Majors who wish to enroll in the yearlong senior essay must apply for the honors essay track in their junior year. By the appropriate date, students should submit to the office of the DUS: (1) the honors essay application, (2) a senior essay form signed by a faculty adviser who has agreed to supervise the student during both terms of the senior year; and (3) a one-page statement describing the research project.

Honors in the major will be awarded to students who achieve an A or A- grade for the honors essay, which also meets the standard for honors (as determined by a second reader appointed by the DUS), and who achieve a minimum 3.7 GPA in all Political Science courses where a letter grade is awarded.

ADVISING

The DUS and other members of the department can provide advice about departmental requirements, options within the major, requirements of two majors, study abroad, and other matters related to the major. Although advisers (beyond the DUS and the senior essay adviser) are not formally assigned, students are encouraged to seek advice from other department faculty members who are knowledgeable about their fields of interest. Information on faculty interests can be found on the department website.

Combined B.A./M.A. degree program Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, “Simultaneous Award of the Bachelor's and Master's

Degrees." Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in Political Science.

STUDY ABROAD

Students who study in the summer term or in a junior term abroad program may, with the approval of the DUS, count up to two courses toward the major. Students who study in a junior year abroad program may, with the approval of the DUS, count up to four courses toward the major. Students may also petition to have non-Yale courses that were not taught in political science departments count toward the major. Pending approval of the DUS, these courses will count toward the maximum number of substitutions.

SUMMARY OF MAJOR REQUIREMENTS

B.A. DEGREE, STANDARD PROGRAM

Prerequisites None

Number of courses *Standard major*—12 term courses; *intensive major*—15 term courses

Distribution of courses 2 intro courses; 2 core lectures; 2 seminars (1 in senior year); 1 course in methodology and formal theory subfield; 2 courses in each of any two subfields (excluding methodology and formal theory subfield)

Substitution permitted 2 courses from other depts with DUS approval

Senior requirement 1-term senior essay in sem or in PLSC 4900; or 2-term senior essay in PLSC 4900, PLSC 4901

Intensive major 1 addtl elective; PLSC 4900 in spring term of junior year; 2-term senior essay in PLSC 4901, PLSC 4903

B.A. DEGREE, INTERDISCIPLINARY CONCENTRATION

Prerequisites None

Number of courses *Standard major with interdisciplinary concentration*—12 term courses; *intensive major with interdisciplinary concentration*—15 term courses

Distribution of courses 7 courses in concentration: 2 intro courses; 2 core lectures; 2 seminars (1 in senior year); 1 course in methodology and formal theory subfield; outside of concentration: 2 courses in each of any two subfields

Substitution permitted 3 courses from other depts with DUS approval (2 courses from other depts with DUS approval for intensive major)

Senior requirement 1-term senior essay in sem or in PLSC 4900; or 2-term senior essay in PLSC 4900, PLSC 4901; both options on subject within concentration

Intensive major 1 addtl elective; PLSC 4900 in spring term of junior year; 2-term senior essay in PLSC 4900, PLSC 4901 on subject within concentration

FACULTY OF THE DEPARTMENT OF POLITICAL SCIENCE

Professors Bruce Ackerman, Akhil Amar, Seyla Benhabib (*Emeritus*), David Cameron (*Emeritus*), Jennifer Gandhi, Bryan Garsten, Alan Gerber, Jacob Hacker, Gregory Huber, Hélène Landemore, Joseph La Palombara (*Emeritus*), Isabela Mares, David

Mayhew (*Emeritus*), Adam Meirowitz, Gerard Padro i Miquel, Doug Rae (*Emeritus*), John Roemer (*Emeritus*), Susan Rose-Ackerman (*Emeritus*), Nicholas Sambanis, Kenneth Scheve, Jasjeet Sekhon, Ian Shapiro, Stephen Skowronek, Steven Smith, Milan Svolik, Peter Swenson (*Emeritus*), Steven Wilkinson, Elisabeth Wood

Associate Professors P. Aronow, Katharine Baldwin, Alexander Coppock, Ana De La O, Alexandre Debs, Joshua Kalla, Daniel Mattingly

Assistant Professors Kevin DeLuca, Allison Harris, Melody Huang, Christina Kinane, Shiro Kuriwaki, Egor Lazarev, Soyoung Lee, Charles McClean, Giulia Oskian, Didac Queralt, Noam Reich, Lucia Rubinelli, Emily Sellars, Ian Turner

Senior Lecturers Stephen Latham, David Simon

Lecturers Andrea Aldrich, David Allison, Federico Brandmayr, Greg Collins, John DeStefano, Kevin Elliott, Amir Fairdosi, Michael Fotos, Karen Goodrow, Maria Jose Hierro, Mordechai Levy-Eichel, Max Lewis, Joanne Lipman, Alexander Rosas, Eleanor Schiff, Daniel Schillinger, Gordon Silverstein, Sushant Singh, Heather Wilford, Graeme Wood, Lauren Young

Portuguese

Director of undergraduate studies: Kenneth David Jackson
(k.jackson@yale.edu); span-port.yale.edu

Portuguese is taught at Yale as part of the Department of Spanish and Portuguese.

The major in Portuguese is a liberal arts major intended to develop competence in the Portuguese language and to provide students with a comprehensive knowledge of the literatures and cultures of Portugal, Brazil, and African and Asian lands of Portuguese language or influence.

PREREQUISITE

Students begin the study of Portuguese with PORT 1100, 1250, or S112. After two years of Portuguese language study, or equivalent, students have sufficient proficiency to take advanced courses in Luso-Brazilian literature and culture.

The prerequisite for the major is PORT 1300 or the equivalent.

PLACEMENT PROCEDURES

All students who have not yet taken Portuguese at Yale are expected to take the departmental placement test, with the exception of students who have no previous knowledge of Portuguese. The test covers reading, writing, speaking, and listening skills. See the department website for placement test times and details.

REQUIREMENTS OF THE MAJOR

The requirements for the Portuguese major consist of ten term courses beyond the prerequisite. Students must take at least five term courses in the literatures or cultures of the Portuguese world. In completing their programs, students may elect up to four courses in other languages and literatures, anthropology, history, or history of art, or from study abroad, that are related to their field of study and approved by the director of undergraduate studies (DUS).

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

All majors must present a senior essay. The essay is written in PORT 4910 and/or 4920. A maximum of two credits count toward the major.

ADVISING

Juniors and seniors majoring in Portuguese may, with the permission of the instructor and the director of graduate studies, enroll in graduate courses in Portuguese.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite PORT 1300 or equivalent

Number of courses 10 term courses beyond prereq (incl senior essay course)

Distribution of courses At least five term courses in literatures or cultures of the Portuguese world

Substitution permitted With DUS permission, up to 4 relevant courses from other depts or study abroad; with DUS permission, courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements.

Senior requirement Senior essay (PORT 4910 and/or 4920)

CERTIFICATE OF ADVANCED LANGUAGE STUDY

Certificate Director: Kenneth David Jackson (k.jackson@yale.edu)

The Department of Spanish and Portuguese offers a Certificate of Advanced Language Study in Portuguese. A certificate adviser, typically the director of undergraduate studies (DUS), advises students on the certification process and certifies to the University Registrar's Office that students have completed the stated requirements before the end of eight terms of study. The Certificate of Advanced Language Study, once certified, is listed on the student transcript.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses, all beyond the L4 level in Portuguese, at least two of which must be Yale courses designated as L5. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the certificate adviser, one advanced non-L5 course, conducted in Portuguese, such as an independent study course (graded pass/fail), a graduate seminar, or an advanced seminar may count toward certification requirements.

The adviser may approve the substitution of one credit earned as part of a Yale or Yale-designated study abroad program and taught in Portuguese to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure those courses appear on their transcripts.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY OF THE DEPARTMENT OF SPANISH AND PORTUGUESE

Professors Santiago Acosta, Aníbal González-Pérez, K. David Jackson, Nicholas R. Jones, Olivia Lott, Noël Valis, Jesús R. Velasco, Aurélie Vialette, Lisa Voigt

Senior Lector II Jorge Méndez-Seijas

Senior Lectors I María Pilar Asensio-Manrique, Carolina Baffi, María José Gutiérrez Barajas, Mercedes Carreras, Sebastián Díaz, María de la Paz García, Rosamaría León,

Luna Nájera, Juliana Ramos-Ruano, Lissette Reymundi, Lourdes Sabé-Colom, Noelia Sanchez Walker, Giseli Tordin, María M. Vázquez

Lectors Mariana Centanin Bertho, Igor De Souza, Kevin Ennis**,** Sarah Glenski, Mayte López, Ian Russell

Senior Lecturer II Alex Gil

Psychology

Director of undergraduate studies: Yarrow Dunham (yarrow.dunham@yale.edu), psychology.yale.edu

Psychology is the scientific study of the mind, the brain, and human behavior. The Psychology department offers coursework and research opportunities in the fields of clinical, cognitive, developmental, neuroscientific, and social psychology. By studying psychology, students better understand human behavior, including who we are, how we do the things we do, and how we enhance our lives and society. The Psychology major provides a foundation for careers in education and research; law; medicine and public health; politics and public policy; and in business fields such as marketing, finance, and management.

COURSE NUMBERING

Courses in the department are organized so that they are best taken in several parallel sequences. Courses numbered 1100–1900 and ending in a zero are core survey courses that introduce students to major areas of psychology and provide additional background for more advanced courses. These courses represent major content areas of psychology; students should sample broadly from them before specializing. Courses numbered from 2000–2090 focus on statistics. Courses numbered 2100–2990 teach general methodology or data collection in various areas of psychology. Courses numbered from 3000–3990 are more advanced courses in a particular specialization. Senior seminars, whose enrollment is limited to no more than twenty students, are numbered from 4000–4890. These seminars are best taken once a student has the appropriate background. Courses numbered from 4900–4990 are special tutorial courses that require permission of the adviser and the director of undergraduate studies (DUS).

PREREQUISITE

PSYC 1100, a general survey course, is a prerequisite to several 1000-level and all 2000-level and above courses. This prerequisite may alternatively be satisfied by a score of 5 on the Psychology Advanced Placement test or a score of 7 on the IB Psychology exam.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for Psychology major requirements.

Standard major The standard major in Psychology for both the B.A. degree program and the B.S. degree program requires twelve credits beyond PSYC 1100, including the senior requirement. The difference between the B.A. and the B.S. degree programs is the senior requirement (see below).

1. Because psychology is so diverse a subject, every student is required to take two courses from the social science point of view in psychology and two from the natural science point of view in psychology. Listed below are examples of courses that fulfill these requirements. A complete list of courses, updated each term, may be found on Yale Course Search (YCS) by searching "Any Course Information Attribute." At least one from each group must be a course designated as Core in the course listings and below. Students are expected to take their two core courses

as early as possible in the major, normally within two terms after declaring their major.

Social science core (YC PSYC Social Science Core): PSYC 1400, 1500, 1700

Social science: Search YCS for courses with the YC PSYC Social Science designation

Natural science core (YC PSYC Natural Science Core): PSYC 1300, 1600

Natural science: Search YCS for courses with the YC PSYC Natural Science designation.

2. Because statistical techniques and the mode of reasoning they employ are fundamental in psychology, a course in statistics is required, preferably prior to the senior year. A student may take S&DS 1000 or 2300 to satisfy this requirement. A student who has a score of 5 on the AP Statistics Exam must take S&DS 2300 or 1230 (YData). If approved in advance by the DUS, a second course in statistics or quantitative methodology that focuses on advanced techniques relevant for research in psychology can be counted towards the major as a PSYC elective.
3. To ensure some direct experience in collecting and analyzing data, students must elect at least one research methods course, preferably before the senior year, in which research is planned and carried out. For students pursuing the BS degree, this course **must** be taken prior to the senior year. Courses numbered between 2100–2990 fulfill this research methods requirement.
4. Students may, with permission of the DUS, count up to three term courses in other related departments toward the major. Appropriate courses are rare and only approved when the course has substantial empirical psychology content. Students should consult with the DUS in Psychology about selecting outside courses and should not assume that a course will count prior to that consultation. Getting this approval in advance is highly recommended.

Students interested in research are encouraged to take an independent study course (PSYC 4925) as early as the sophomore year. Students may also take PSYC 4950 for one-half course credit of independent research per term with prior permission of the faculty adviser and the DUS (this course is often taken twice in sequence). To obtain permission, follow the instructions on the department website to fill out the enrollment survey and then add the class normally, being sure to request instructor permission. This process must be completed at least one week before the end of the add/drop period for a given semester. These independent study courses are graded P/F. No more than a total of three credits from PSYC 4900–4990 combined may count toward the major.

Neuroscience concentration Students with a major interest in neuroscience may wish to elect the neuroscience concentration. Such students are considered Psychology majors for whom the requirements have been modified to accommodate their interests and to reflect the multidisciplinary nature of modern neuroscience and psychology. Given the broad nature of the field of neuroscience, students may wish to concentrate their studies in one area of the field (e.g., behavioral, cellular and molecular, cognitive, affective, social, clinical, or developmental). Interested students are encouraged to contact the concentration adviser, Stephanie Lazzaro (stephanie.lazzaro@yale.edu). Majors in the neuroscience concentration must check in

with the concentration adviser at the beginning of each term in their junior and senior years.

Requirements for the neuroscience concentration are the same as for the standard major, with the additional requirements listed below. A complete list of courses, updated each term, may be found on Yale Course Search (YCS) by searching "Any Course Information Attribute."

1. Two terms of introductory biology are required for the major, BIOL 1010-BIOL 1040. Students who have scored 5 on the Advanced Placement test in Biology or scored 7 on the IB Biology exam may place out of these courses.
2. Students must take PSYC 1600 and a data-collection course (YC PSYC NSCI Track RsrchMthds) chosen from PSYC 2600, 2538, 2700, 2658 or 2670. PSYC 2690L, 2760, or MCDB 3200 may substitute for the PSYC 1600 requirement, or MCDB 3200 and 3210L may substitute for PSYC 2690L or PSYC 2760, but not both. If MCDB 3200 is substituted for a Psychology course, it cannot be counted as one of the two advanced science courses outside the department (see item 4 below).
3. As required for the standard major, students in the neuroscience concentration must take two social science courses, at least one of which must be designated as Core in the course listings. Students in the neuroscience concentration must also take a course from the natural science list in addition to the courses specified in item 2 above.
4. At least two advanced science courses (YC PSYC NSCI Track Adv Scie) must be chosen from Molecular, Cellular, and Developmental Biology and Ecology and Evolutionary Biology courses numbered 2000 and above that deal with human and/or animal biology; recommended courses include MCDB 2000, 2020, 2050, 2100, 2500, 3000, 3150, 3200, EEB 2220 and 2225. Certain courses outside of these departments may also meet the advanced science requirement, including BENG 3200, BENG 5440, CPSC 4750, MB&B 3000, 3010, 4200, 4350, 4430, 3520, MATH 2220, MATH 2250, and MATH 2410. Other courses may qualify for this requirement with permission of the neuroscience concentration adviser. Laboratory courses do not count toward the advanced science requirement. Students should note that many advanced science courses have prerequisites that must be taken first.

Credit/D/Fail No more than two courses taken Credit/D/Fail may be applied toward the requirements of the major; no 2000-level course, or course taken to satisfy a 2000-level requirement (the statistics or research methods requirement), can be taken Credit/D/Fail and then applied toward the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Standard major Majors are required to earn two course credits from courses numbered PSYC 4000–4990. At least one of these courses (excluding PSYC 4925 and PSYC 4950, which can only be taken P/F) must be taken during the senior year, for which a student must write a substantial final paper (a minimum of 5,000 words) and receive a letter grade. The B.A. degree is typically awarded to students who conduct a nonempirical literature review during senior year. There are no restrictions in the research format

for the B.A. The B.S. degree is awarded to students who conduct empirical research through PSYC 4990 during senior year. An empirical research project normally includes designing an experiment and collecting and analyzing the data. Students pursuing the B.S. degree will want to identify a faculty advisor well in advance of the semester in which they intend to complete their senior essay, and they may want to seek research experiences with that faculty member prior to the senior year.

Neuroscience concentration The senior requirement for the neuroscience concentration is the same as for the standard major, except that the two required course credits from PSYC 4000–4990 must have neuroscience content (YC PSYC NSCI Track Senior Sem designation). Students pursuing the B.S. degree in the concentration must carry out a neuroscientific empirical project in PSYC 4990 and must be supervised by a faculty member within the neuroscience area of the Psychology department. Students who wish to work with an affiliated faculty member studying neuroscience outside the department must obtain permission from the neuroscience concentration adviser. Students pursuing the B.S. degree will want to identify a faculty advisor well in advance of the semester in which they intend to complete their senior essay, and they may want to seek research experiences with that faculty member before the senior year.

Distinction in the Major To be considered for Distinction in the Major, students must submit a senior essay to the Psychology department at least one week before the last day of classes in the term when the course used for the senior essay is taken. Senior essays that are submitted after the deadline will be subject to grade penalties. Senior essays considered for Distinction in the Major are graded by a second reader and the essay adviser. Senior essays must be submitted to the department by the deadline.

ADVISING

Schedules for all majors must be discussed with, and approved by, the DUS or the adviser for the neuroscience concentration in Psychology. For questions concerning credits for courses taken at other institutions or at Yale but outside the Department of Psychology, students should consult with the DUS. For questions concerning the neuroscience concentration, students should consult with the adviser for the neuroscience concentration in Psychology.

Computer Science and Psychology major The interdepartmental major in Computer Science and Psychology may be considered by students with interests lying squarely between the two disciplines. See Computer Science and Psychology for more information.

SUMMARY OF MAJOR REQUIREMENTS

STANDARD MAJOR

Prerequisite PSYC 1100

Number of courses 12 courses beyond prereq (incl senior req)

Specific course required S&DS 1000 or S&DS 2300

Distribution of courses *B.A.* or *B.S.*—2 social science courses and 2 natural science courses, as specified; 1 course numbered PSYC 2100–2990

Senior requirement *B.A.*—1 course credit from PSYC 4000–4890 or 4990 taken during senior year; 1 additional course credit from PSYC 4000–4990; *B.S.*—PSYC 4990 taken during senior year; 1 additional course credit from PSYC 4000–4990

NEUROSCIENCE CONCENTRATION

Prerequisite PSYC 1100

Number of courses 12 courses beyond prereq (incl senior req); same as for the standard major with the additional requirements listed below

Specific courses required BIOL 1010–BIOL 1040 unless students place out; PSYC 1600; PSYC 2600, 2538, 2700, 2658 or 2670

Distribution of courses *B.A.* or *B.S.*—2 social science courses and 1 natural science course, as specified; at least 2 advanced science courses, as specified

Substitution permitted MCDB 3200 or PSYC 2690L or PSYC 2760 may substitute for PSYC 1600; or MCDB 3200 and 3210L may substitute for PSYC 2690L or PSYC 2760; S&DS 1030 or exam arranged with instructor for PSYC 2100

Senior requirement *B.A.*—1 course credit from PSYC 4000–4890 or 4990 with neuroscience content taken during senior year; 1 additional course credit from PSYC 4000–4990 with neuroscience content; *B.S.*—PSYC 4990 taken during senior year, with neuroscience content in a research project; 1 additional course credit from PSYC 4000–4990 with neuroscience content

FACULTY OF THE DEPARTMENT OF PSYCHOLOGY

Professors Woo-kyoung Ahn, John Bargh, Tyrone Cannon, B. J. Casey, Marvin Chun, Margaret Clark, Melissa Ferguson, Jutta Joormann, Frank Keil, Joshua Knobe, Gregory McCarthy, Jennifer Richeson, Peter Salovey, Laurie Santos, Brian Scholl, Nick Turk-Browne

Associate Professors Arielle Baskin-Sommers, Steve Wohn Chang, Molly Crockett, Yarrow Dunham, Avram Holmes

Assistant Professors Dylan Gee, Maria Gendron, Julian Jara-Ettinger, Julia Leonard, Sam McDougle, Robb Rutledge, Ilker Yildirim

Lecturers Jennifer Hirsch, Stephanie Lazzaro, Kristi Lockhart, Mary O'Brien, Matthias Siemer

Quantum Science and Engineering Certificate

Certificate director: Yongshan Ding (yongshan.ding@yale.edu)

Quantum information science and engineering explores how the principles of quantum mechanics can be harnessed to encode, manipulate, process, learn, and distribute information in fundamentally novel ways. This rapidly evolving field unites experts from physics, computer science, engineering, chemistry, and material science to develop revolutionary technologies in computing, simulation, sensing, timing, and networking, promising transformative impacts across society.

REQUIREMENTS

See Links to the attributes indicating courses approved for the certificate requirements.

Students must complete five courses (5 credits), one of which must be PHYS 3450 or CPSC 4470. The remaining four courses may be chosen from courses offered by the Applied Physics, Chemistry, Computer Science, Electrical Engineering, Global Affairs, Mathematics, Physics, or Statistics & Data Science departments. Courses that fulfill the requirements of the certificate carry the *YC Quantum Elective* attribute. The minimum grade for all courses is a C.

No more than two course credits may overlap in the fulfillment of the requirements of the Quantum Science & Engineering Certificate and of a major, a simultaneous degree, or another certificate. In addition to the Yale College course overlap policy, students earning this certificate may not overlap any 1000/2000 level courses; only two 3000+ level courses may overlap. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major. Approved graduate and professional school courses may count toward the certificate. Non-Yale courses may not count toward the certificate. Students are also encouraged to participate in the following optional activities:

- Join the Yale Undergraduate Quantum Computing group (YuQC)
- Participate in YdQC and other quantum hacakathons
- Attend colloquia offered by the Yale Quantum Institute
- Tour the Yale Quantum Institute laboratories

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the certificate.

DECLARATION OF CANDIDACY

Students must declare their intent to earn a certificate by the last day of add/drop period in their final term of enrollment. This is done on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub. Once declared, Degree Audit will track students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Number of courses 5 course credits

Distribution of courses PHYS 3450 or CPSC 4470 and 4 electives that carry the YC Quantum Elective attribute

Religious Studies

Director of undergraduate studies: Eric Greene, (eric.greene@yale.edu) 320 York Street, 432-4857; religiousstudies.yale.edu

Religious Studies offers a curriculum of challenging coursework that explores and critically analyzes religious traditions and systems of value. The many diverse courses delve into the history and meaning of rituals, canonical and non-canonical texts, and theological and social categories and how they have been shaped by and construct institutions, habits, hierarchies, and collectives. The study of religion probes the organization of society, gender roles, global affairs, war, violence, terrorism, and conflicting orthodoxies. Multiple disciplinary lenses and methodological approaches inform and shape the field, including: anthropology, history, philosophy, philology, psychology, and sociology. Courses on religious practices and formations span the globe over the course of history, from antiquity until the present day. The curriculum also addresses competing value systems that circulate in pop culture and politics, with studies of fundamentalism, spirituality, secularism, atheism, and consumerism.

The Department of Religious Studies is particularly known for its promotion of scholarly research by undergraduates. The tight cohort of majors have the unique opportunity to work closely with leading scholars of the field. The curriculum enables majors to acquire the linguistic, philosophical, and historical acumen necessary for in-depth research projects during their senior year. While courses normally have no prerequisites, some advanced seminars may require the permission of the instructor. The multidisciplinary nature of Religious Studies makes it attractive both for students seeking two majors and for those seeking to delve deep into a field of study as it relates broadly to the humanities.

REQUIREMENTS OF THE MAJOR

The Religious Studies major requires twelve term courses, to include a core of five courses, a junior seminar (RLST 4900), a two-term senior essay (see below) and four electives. Religious Studies majors develop specialized areas of expertise as they plan a coherent program in consultation with the director of undergraduate studies (DUS) and other members of the faculty.

Core requirement A core of five courses in Religious Studies is required of all majors and should be selected in consultation with the DUS. These courses should originate in the Religious Studies department and carry a RLST subject code. One of the core courses must be an introductory course, numbered 0001–1999; another must introduce breadth into the student's core area of study; the remaining three courses must form a cohesive cohort of courses leading students to the area of expertise upon which they write their senior essay.

Electives The four elective courses are designed to complement a student's area of expertise. Collectively they should form the basis for advanced work in the major conducted during the senior year. These electives can be taken either within or beyond the Department of Religious Studies. They can comprise language study, topics and methods from other disciplines, or further advanced coursework within the department. Through these electives, students develop expertise in methods, regions, historical periods, or bodies of literature that inform their area of study and their work

for the senior essay. Students pursuing a double major or an outside certificate may count up to two courses taken for the fulfillment of their other major or certificate toward the elective requirement in Religious Studies.

Credit/D/Fail No more than 1 course taken Credit/D/Fail may be applied toward the requirements of the major. RLST 4900 may not be taken Credit/D/Fail.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students must write a senior essay under the supervision of a faculty adviser in the student's core area of study. In selecting a senior essay topic, students normally choose a subject on which they have completed coursework before commencing the senior year. The essay counts as two courses toward the major and is taken in both terms of the senior year. The student should begin choosing a senior essay topic during the second term of the junior year, and early in the first term of the senior year must submit a Statement of Intention approved by a faculty adviser and the DUS. The senior essay courses, RLST 4910 and RLST 4920, include research and writing assignments as well as colloquia in which seniors present and discuss their research. Students submit at least ten pages of the essay to the DUS by the last day of classes in the first term in order to receive a grade of "satisfactory" for that term.

ADVISING

Students majoring in Religious Studies who plan to do graduate work in the subject are strongly encouraged to study the languages that they will need for their graduate programs.

Courses in the Divinity School Some Divinity School courses may count toward the major, with permission of the DUS. Divinity School faculty are eligible to advise senior essays. Information about courses and faculty may be found in the Divinity School online bulletin.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific course required RLST 4900

Distribution of courses 5 core RLST courses to include: 1 intro course (0001–1999), 1 breadth course, 3 related core courses; 4 electives, as described and with DUS permission

Substitution permitted Divinity School courses, with DUS permission

Senior requirement Senior essay (RLST 4910, RLST 4920)

FACULTY OF THE DEPARTMENT OF RELIGIOUS STUDIES

Professors Stephen Davis, Carlos Eire, Hwansoo Kim, Nancy Levene, Kathryn Lofton, Ivan Marcus, Laura Nasrallah, Eliyahu Stern, Travis Zadeh

Associate Professors Maria Doerfler, Eric Greene, Sarit Kattan Gribetz, Noreen Khawaja, Todne Thomas

Assistant Professors Supriya Gandhi, Sonam Kachru, Marta Sanvido

Lecturers Jimmy Daccache, Adam Ployd, Matthew Steele

Russian

Director of undergraduate studies: Claire Roosien (claire.roosien@yale.edu)**;** language coordinator: Constantine Muravnik (constantin.muravnik@yale.edu), HQ 535, 320 York Street, 432-0995; slavic.yale.edu

The major in Russian offered by the Department of Slavic Languages and Literatures acquaints students with Russian literature and culture, develops students' appreciation of literary values and skill in literary analysis, and gives them a basic competence in Russian. For an area major in Russian studies, see Russian, East European, and Eurasian Studies, an interdisciplinary program administered by the Department of Slavic Languages and Literatures.

PLACEMENT PROCEDURES

Students who have previously studied Russian formally or informally are required to take the Russian placement exam. This brief oral exam helps determine which Russian course best fits each student's background. Contact the Russian language coordinator, Constantine Muravnik (constantin.muravnik@yale.edu) to schedule the oral placement exam or for registration information.

PREREQUISITES

Prerequisite to the major is second-year Russian, RUSS 1400, 1420, 1450, or S140. The department offers three sequences of language courses to fulfill the prerequisite: either (1) RUSS 1100, 1200, 1300, 1400, or (2) RUSS 1250, 1450 or (3) courses for heritage speakers, RUSS 1220, 1420. Prospective majors should complete the prerequisites by the end of their sophomore year or accelerate their course of study by taking summer courses or studying abroad. While completing the prerequisite, students are encouraged to begin fulfilling the requirements of the major that do not presuppose advanced knowledge of Russian by taking courses in Russian history and Russian literature in translation.

REQUIREMENTS OF THE MAJOR

In addition to the prerequisite, the major in Russian requires eleven term courses, which must include the following (some courses may fulfill more than one requirement):

1. Third-year Russian: RUSS 1500 and 1510.
2. Fourth-year Russian: RUSS 1600 and 1610.
3. Two terms of Russian literature in translation, one in 19th-century or earlier Russian literature and one in 20th-century or later Russian literature. Russian First-Year Seminars and courses numbered 2000 or higher may fulfill this requirement.
4. One content course in which Russian is the language of instruction (RUSS 1700–1900).
5. One course in Russian, East European, or Eurasian history or social sciences.
6. RUSS 4900 or 4910. The senior essay is the intellectual culmination of the student's work in the major. All primary sources used in the essay must be read in Russian.

If the language proficiency is met without coursework, these course requirements must be fulfilled through additional term courses to bring the overall total to 11 term courses.

A Yale summer program in Russian culture may be used to fulfill the requirements, with the approval of the director of undergraduate studies (DUS).

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

All majors write a senior essay (RUSS 4900 or 4910), an independent project carried out under the guidance of a faculty member. The senior essay takes the form of a substantial article, no longer than 13,000 words, excluding footnotes and bibliography. By the end of the junior year, students should declare their general topic and arrange for a faculty adviser, in consultation with the DUS. Students planning to conduct summer research for the senior essay, especially if abroad, should contact the DUS early in the spring semester of the junior year and apply for fellowships.

Students may opt to enroll in both RUSS 4900 and RUSS 4910, but only one of these courses counts toward the major requirements.

Optionally, students may opt to prepare for the senior essay in the term before they enroll in either RUSS 4900 or 4910. In this instance, students submit a proposal to their adviser (up to two pages double spaced) by the first day of the term before they enroll in RUSS 4900 or RUSS 4910. They also submit a draft of at least ten pages, or a detailed outline of the entire essay by the end of the midterm break. Students finalize their essay during the term in which they are enrolled in RUSS 4900 or 4910. The final essay is due ten days before the last day of classes, typically around April 15 for those students graduating in the spring or November 25 for those graduating in December. A member of the faculty other than the adviser grades the essay. Senior essays will be considered for prizes.

Students pursuing two majors need to fulfill the senior requirement of both majors. If the second major allows, students may enroll in both RUSS 4900 and 4910 and write an essay longer than a single-term essay. In this case, students count the second term of the Russian senior essay as their twelfth course in the Russian major.

ADVISING

Courses in the Graduate School are open to qualified undergraduates with permission of the instructor and of the director of graduate studies. Course descriptions are available at the office of the DUS.

STUDY ABROAD

Students majoring in Russian are strongly encouraged to spend a summer or a term studying abroad under the auspices of programs approved by the DUS. Language courses, as well as RUSS S241, S242, and S243, taken during the summer or during a term in approved programs may substitute for certain advanced Russian courses at Yale. Students interested in studying abroad should consult the DUS well before their junior year. Students can apply for FLAS and Fox fellowships to support their travel.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite RUSS 1400, 1420, 1450, S140, or placement exam

Number of courses 11 term courses beyond prereq (incl senior essay)

Specific courses required RUSS 1500, 1510, 1600, 1610

Distribution of courses 1 course in 19th-century or earlier Russian literature in translation, as specified; 1 course in 20th-century or later Russian literature in translation, as specified; 1 content course taught in original language, as specified; 1 course in Russian, East European, or Eurasian history or social sciences, as specified

Substitution permitted Yale summer program in Russian culture (RUSS S241, S242, or S243) for electives

Senior requirement Senior essay (RUSS 4900 or 4910)

CERTIFICATE OF ADVANCED LANGUAGE STUDY

Certificate Director: Claire Roosien (claire.roosien@yale.edu)

The Department of Slavic Languages and Literatures offers a Certificate of Advanced Language Study in Russian. A certificate adviser, typically the director of undergraduate studies (DUS), advises students on the certification process. The Certificate of Advanced Language Study is listed on student transcripts.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. Students should take L5 content courses only after they have completed RUSS 1510, Third-Year Russian II. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the adviser, one advanced non-L5 course, conducted in the target language, such as an independent study course (graded pass/fail), a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course taught in English to count toward the certification requirements provided the course includes at minimum a weekly discussion section conducted entirely in the target language. The discussion section must enroll a minimum of three students and the course must be designated as LxC in the course description.

The certificate adviser may also approve the substitution of up to two credits earned during study abroad and taught in the target language to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure those courses appear on their transcript.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but

at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY OF THE DEPARTMENT OF SLAVIC LANGUAGES AND LITERATURES

Professors Edyta Bojanowska (*Slavic Languages and Literatures*), John MacKay (*Film & Media Studies, Slavic Languages and Literatures*), Marijeta Bozovic (*Slavic Languages and Literatures*)

Associate Professor Molly Brunson (*Slavic Languages and Literatures*)

Assistant Professors Jinyi Chu (*Slavic Languages and Literatures*), Claire Roosien (*Slavic Languages and Literatures*), Nari Shelekpayev (*Slavic Languages and Literatures*)

Senior Lector II Constantine Muravnik (*Slavic Languages and Literatures*), Julia Titus (*Slavic Languages and Literatures*)

Senior Lectors I Krystyna Illakowicz (*Slavic Languages and Literatures*), Olha Tytarenko (*Slavic Languages and Literatures*)

Lector I Anastasia Selemeneva (*Slavic Languages and Literatures*)

Russian, East European, and Eurasian Studies

Director of undergraduate studies: Claire Roosien (claire.roosien@yale.edu); language coordinator: Constantine Muravnik (constantine.muravnik@yale.edu), HQ 538, 320 York St.; slavic.yale.edu

The major in Russian, East European, and Eurasian Studies, administered by the Department of Slavic Languages and Literatures, offers an interdisciplinary approach to the study of a broad region: Russia, Ukraine, Belarus, the Caucasus, and central Asia; Poland, Hungary, the Czech and Slovak Republics, and other areas in east central Europe; and the Balkans. Students majoring in RSEE may concentrate exclusively on Russian Studies, or on East European or Eurasian Studies. The major is appropriate for students considering careers in international public policy, diplomacy, or business, and is also suited to students wishing to continue academic work.

PLACEMENT PROCEDURES

Students who have previously studied Russian formally or informally are required to take the Russian placement exam. This brief oral exam helps determine which Russian course best fits each student's background. Contact the Russian language coordinator, C (irina.dolgova@yale.edu)onstantine Muravnik (constantine.muravnik@yale.edu), to schedule the oral placement exam or for information about preregistration.

Entering first-year students who have some knowledge of Ukrainian or Polish should contact Olha Tytarenko (olha.tytarenko@yale.edu) (Ukrainian) or Krystyna Illakowicz (krystyna.illakowicz@yale.edu) (Polish) to arrange to take a brief placement examination.

PREREQUISITES

Russian Studies concentration Completion of Second-Year Russian (RUSS 1400, 1420, 1450 or S140) or placement exam.

East European Studies or Eurasian Studies concentration Two semesters of the first-year sequence in an East European or an Eurasian language or a placement exam.

REQUIREMENTS OF THE MAJOR

Students select one of three concentrations to complete the requirements for the major in Russian, East European, and Eurasian Studies. A full understanding of these areas demands knowledge of its languages and therefore students are encouraged to learn more than one language.

Russian Studies concentration Twelve term courses, including the senior requirement, are required for the Russian Studies concentration. Students must take two courses in Russian, East European, or Eurasian history; one RSEE-area focused course in the social sciences, such as those found in anthropology, economics, sociology, political science, global affairs, and other disciplines of social science; one course in Russian, East European, or Eurasian literature or culture, selected in consultation with the director of undergraduate studies (DUS); and the Senior Essay (RSEE 4900 or RSEE 4910). To fulfill the language requirement students must demonstrate a proficiency in Russian by completing RUSS 1500 and 1510 or by passing an equivalency exam. A maximum of five language courses may be counted toward the major. If language proficiency is met without coursework, the course

requirements must be fulfilled through additional term courses to bring the overall total to twelve courses. Electives are selected in consultation with the DUS and may include RUSS 1600 and 1610, a content course taught in Russian at the 1700–1900 level, or courses in other East European or Eurasian languages at the second-year level or above.

East European Studies or Eurasian concentration Eleven term courses, including the senior requirement, are required for the East European and the Eurasian concentrations. The requirements are the same as for the Russian Studies concentration, excluding the language requirements. To fulfill the language requirement students must demonstrate a proficiency in either an East European or Eurasian language (such as Czech, Polish, Romanian, Bosnian-Serbian-Croatian, Hungarian, Ukrainian, or those languages taught through the Shared Course Initiative) by completing the third-year level (4 term courses) of the chosen language or by passing an equivalency exam. The remaining two courses are chosen in consultation with the DUS. If language proficiency is met without coursework, the course requirements must be fulfilled through additional term courses to bring the overall total to eleven courses.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

All majors write a senior essay, an independent project carried out under the guidance of a faculty member. The senior essay takes the form of a substantial article, no longer than 13,000 words, excluding footnotes and bibliography. By the end of the junior year, students should declare their general topic and arrange for a faculty adviser, in consultation with the DUS. Students planning to conduct summer research for the senior essay, especially if abroad, should contact the DUS early in the spring semester of the junior year and apply for fellowships.

Students may opt to enroll in both RSEE 4900 and RSEE 4910, but only one of these courses counts toward the major requirements.

Optionally, students may opt to prepare for the senior essay in the term before they enroll in either RSEE 4900 or 4910. In this instance, students submit a proposal to their adviser (up to two pages double spaced) by the first day of the term before they enroll in RSEE 4900 or RSEE 4910. They also submit a draft of at least ten pages, or a detailed outline of the entire essay by the end of the midterm break. Students finalize their essay during the term in which they are enrolled in RSEE 4900 or RSEE 4910. The final essay is due ten days before the last day of classes, typically around April 15 for those students graduating in the spring or November 25 for those graduating in December. A member of the faculty other than the adviser grades the essay. Senior essays will be considered for prizes.

Students pursuing two majors need to fulfill the senior requirement of both majors. If the second major allows, students may enroll in both RSEE 4900 and RSEE 4910 and write a longer essay than for the single-term essay. In this case, students count the

second term of the RSEE senior essay as their 13th (Russian Studies concentration) or 12th (East European or Eurasian concentration) course in Russian, East European, and Eurasian Studies.

ADVISING

Qualified students may elect pertinent courses in the Graduate School with the permission of the instructor, the director of graduate studies, and the DUS.

Graduate work The European and Russian Studies program does not offer the simultaneous award of the B.A. and M.A. However, students in Yale College are eligible to complete the M.A. in European and Russian Studies (with concentration in Russia and eastern Europe) in one year of graduate work. Students interested in this option must complete eight graduate courses in the area by the time they complete the bachelor's degree. Only two courses may be counted toward both the graduate degree and the undergraduate major. Successful completion of graduate courses while still an undergraduate does not guarantee admission into the M.A. program. Students must submit the standard application for admission to the M.A. program.

STUDY ABROAD

There are several opportunities for study and travel in eastern Europe and Eurasia. The DUS can provide information on these programs and facilitate enrollment. Students who spend all or part of the academic year in these regions participating in established academic programs usually receive Yale College and major requirement credit. Students are strongly encouraged to take advantage of study abroad opportunities during summers or through the Year or Term Abroad program and should consult the DUS as early as possible.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites *Russian Studies concentration*—RUSS 1400, 1420, 1450 or S140; *East European and Eurasian concentrations*—two courses of first-year sequence in East European or Eurasian language

Number of courses *Russian Studies concentration*—12 term courses beyond prereqs (incl senior req); *East European and Eurasian concentrations*—11 term courses beyond prereqs (incl senior req)

Specific courses required *Russian Studies concentration*—RUSS 1500 and 1510 or equivalency exam

Distribution of courses *All concentrations*—2 courses in RSEE history; 1 RSEE-area focused course in the social sciences, as specified; 1 course in Russian, East European, or Eurasian literature or culture, in consultation with DUS; *Russian Studies concentration*—up to 5 language courses and/or electives in consultation with DUS to fulfill total course requirement; *East European Studies and Eurasian Studies concentrations*—third-year level in East European or Eurasian language or equivalency exam; remaining electives in consultation with DUS to fulfill total course requirement

Senior requirement Senior essay (RSEE 4900 or RSEE 4910)

FACULTY ASSOCIATED WITH THE MAJOR

Professors Edyta Bojanowska (*Slavic Languages and Literatures*), Marijeta Bozovic (*Slavic Languages and Literatures, Film and Media Studies, Women's, Gender, & Sexuality*

Studies), Paul Bushkovitch (*History*), David Engerman (*History)*, John Gaddis (*History*), John MacKay (*Slavic Languages and Literatures, Film & Media Studies*), Douglas Rogers (*Anthropology*), Marci Shore (*History*), Timothy Snyder (*History*), Arne Westad (*History*)

Associate Professors Molly Brunson (*Slavic Languages and Literatures),* Marta Figlerowicz (*Comparative Literature, English*)

Assistant Professors Sergei Antonov (*History*), Jinyi Chu (*Slavic Languages and Literatures*), Sam Hodgkin (Comparative Literature), Egor Lazarev (Political Sciences), Claire Roosien (*Slavic Languages and Literatures*), Nari Shelekpayev (*Slavic Languages and Literatures*)

Senior Lectors II Constantine Muravnik (*Slavic Languages and Literatures*), Julia Titus (*Slavic Languages and Literatures*)

Senior Lectors I Krystyna Illakowicz (*Slavic Languages and Literatures*), Olha Tytarenko (*Slavic Languages and Literatures*)

Lector I Anastasia Selemeneva (*Slavic Languages and Literatures*)

Science

Yale College offers several interdepartmental course sequences for first-year students through the First-Year Seminar Program. In these courses, students encounter current research at Yale and in the broader scientific community across a wide range of scientific fields. The courses intend to develop skills necessary to understand, write, and present research in these areas. Students also identify a Yale research mentor and prepare an independent grant proposal to prepare for summer research.

School of the Environment

For information about Yale College course offerings related to the environment, see Environmental Studies.

The five-year B.A. or B.S./M.E.M. or M.E.Sc. degree program The B.A.–B.S./M.E.M. or M.E.Sc. degree program offers Yale College students the opportunity to earn a bachelor's degree from Yale College and an M.E.M. or M.E.Sc. degree from the Yale School of Environment (YSE) in five years.

Undergraduate requirements During four years of Yale College enrollment, students may complete any standard major. The required academic preparation for the five-year joint degree program is outlined on the YSE website. Generally, students are expected to complete eight courses that are substantially equivalent to YSE courses. Such courses must be relevant to the YSE degree being sought and might include upper-level YC courses, courses that are cross-listed between YSE and YC, or graduate or professional school courses. It is highly recommended that applicants complete undergraduate coursework in the following areas: ecology or ecosystems, physical sciences, social sciences, microeconomics, and statistics before applying.

Master's program requirements By satisfying the eight course undergraduate requirement prior to YSE enrollment, students in the five-year M.E.M. program will, upon graduation, have completed coursework equivalent to the regular M.E.M. requirements. These include attendance at the Summer Training Modules (MODS); enrollment in the fall "Perspectives" course for all first-year M.E.M. students; satisfying the requirements of all Foundational Knowledge courses, and an approved capstone course. Students admitted to the five-year program during their senior year are encouraged to take a gap year before attending YSE. Gap year plans must be communicated to the YSE Admissions Office.

The M.E.Sc. degree is intended to provide students with a deeper disciplinary focus than the M.E.M. All students pursuing a M.E.Sc. degree must have an adviser in place before applying to YSE. The intended YSE faculty adviser must provide a letter as part of the student's application stating their agreement to become the prospective student's YSE adviser. The specific plan to meet the requirements of the M.E.Sc. are to be worked out with a student's adviser, however most continue with deeper research of the subjects undertaken as part of their senior thesis requirement in Yale College.

Admission requirements Students apply to the B.A.–B.S./M.E.M. and M.E.Sc. program in the fall term of the senior year or in the two years immediately following graduation. Applications are submitted through the Yale School of the Environment's application system. Questions about admissions should be directed to the YSE Office of Admissions at admissions.yse@yale.edu. Further information about the program may be viewed on the YSE website.

Jackson School of Global Affairs

For information about Yale College course offerings related to global affairs, see Global Affairs.

The five-year B.A.–B.S./M.P.P. degree program The B.A.–B.S./M.P.P. degree program in Global Affairs offers Yale College students interested in the field of global affairs the opportunity to earn a bachelor's degree from Yale College and a M.P.P. degree from the Jackson School of Global Affairs in a five-year joint program.

Undergraduate requirements In their four years of Yale College enrollment, students complete a standard Yale College major. So long as students are on track to complete their major and degree requirements, as stipulated by Yale College, and once they have been accepted into the B.A.-B.S./M.P.P. program, they must take a minimum of 3 and a maximum of 4 Jackson School graduate courses (for a total of 3, 3.5, or 4 credits) toward their M.P.P. degree.

Master's program requirements Students accepted into the program must complete a total of 12 graduate course credits, including Jackson's core courses. At least 2 of those core courses must be taken during the senior year at Yale College. It is also required that students demonstrate proficiency in a modern language (L4) and complete an approved summer internship or project over the summer prior to their 5th year. Students must maintain a grade average of High Pass with at least two Honors grades. All students must complete Jackson's non-credit leadership and ethics training workshop. During the fifth year, students are in full-time residence at the Jackson School of Global Affairs and must complete at least 8 graduate course credits.

Admission requirements Students apply to the B.A.–B.S./M.P.P. program in the spring term of the junior year. Applicants must complete an application form and submit all undergraduate transcripts, two letters of recommendation (at least one from an instructor in a Yale course), one personal statement, and approval by the dean of the student's residential college. Applications are submitted online through the Jackson School of Global Affairs. Questions about admissions should be directed to Assistant Dean, Asha Rangappa (asha.rangappa@yale.edu).

Further information about the program may be viewed on the Jackson School of Global Affairs website.

School of Public Health

For information about Yale College course offerings related to health, see Global Health Studies.

The five-year B.A.–B.S./M.P.H. degree program The B.A.–B.S./M.P.H. degree program in Public Health offers Yale College students interested in the field of public health the opportunity to earn a bachelor's degree from Yale College and an M.P.H. degree from the Yale School of Public Health (YSPH) in a five-year joint program.

Undergraduate requirements During four years of Yale College enrollment, students complete any standard major. Four of the thirty-six course credits required for the bachelor's degree are typically taken at YSPH in partial fulfillment of the M.P.H. degree requirements. Students may take additional YSPH courses while enrolled in Yale College, but no more than four course credits earned in the professional schools may be applied toward the bachelor's degree. Two Yale College courses selected from an approved list may be counted as electives toward the M.P.H. degree requirements.

Students accepted into the B.A.–B.S./M.P.H. program typically take the following courses at the School of Public Health while enrolled in Yale College: PUBH 505, Biostatistics in Public Health; PUBH 507, Social Justice and Health Equity; PUBH 508, Foundations of Epidemiology and Public Health; PUBH 510, Health Policy and Health Care Systems; and PUBH 513, Major Health Threats: Ethics and Practice.

During the summer between the fourth and fifth years, students complete a public health internship.

Master's program requirements Students accepted into the program affiliate with one of seven departments or programs at the School of Public Health; this affiliation determines the primary adviser and the specific requirements for the five-year program. During the fifth year, students are in full-time residence at the School of Public Health to complete their remaining coursework and master's thesis.

Admission requirements Students apply to the B.A.–B.S./M.P.H. program in the fall term of the junior year. Successful candidates present a verified commitment to improving the health of the public and evidence of quantitative skills. Two terms each of college-level mathematics, science, and social science courses are recommended, although some of these courses can be completed after applying to the program. Additional qualifications may be required by particular departments or programs. Applications are submitted through the School of Public Health's application service, SOPHAS Express, and include transcripts, SAT scores, two letters of recommendation (at least one from an instructor of a Yale course), and a personal statement. Questions about admissions should be directed to Mary Keefe (mary.keefe@yale.edu).

Further information about the program may be viewed on the YSPH website.

Sociology

Director of undergraduate studies: Alex Manning (alex.manning@yale.edu); sociology.yale.edu

Sociology provides the theoretical and empirical foundation for understanding how societies function and how they change over time. Sociologists are interested in the causes and consequences of processes such as the social construction of groups and identity, the evolution of culture, intersubjective meanings, intergroup relations, and hierarchies and social norms. They conduct research on individual behavior and outcomes such as educational attainment, jobs and careers, religious commitment, and political involvement; interpersonal processes such as intimate relationships, sexuality, social interaction in groups, and social networks; the behaviors of organizations and institutions; the causes and consequences of group differences and social inequality; and social change at the societal and global level.

The Sociology major provides both a solid foundation for students interested in careers in the social sciences and a strong background for a variety of professions in which knowledge about social processes and how societies work is relevant. Many recent graduates have gone on to law school, medical school, or graduate programs in public health, business, education, urban planning, criminology, and sociology. Others work in finance, consulting, publishing, marketing, city planning, teaching, research, and advocacy.

The Sociology department offers six undergraduate pathways leading to the B.A. degree: (1) the standard major focuses on sociological concepts, theories, and methods; (2) the concentration in economy and society focuses on the cultural frameworks, relationships, and social institutions that give rise to markets and shape economic behavior; (3) the concentration in health and society emphasizes social processes as they affect health and medicine; (4) the concentration in data and society studies methods of analysis; (5) the concentration in inequality, race, and society considers the dimensions of how discrimination shapes society; and (6) the student-designed program combines sociology with a concentration in a different subject area. Students interested in the major are encouraged to contact the director of undergraduate studies (DUS) early in their academic careers to discuss potential options.

COURSE NUMBERING

Courses in Sociology are divided by level, with introductory courses numbered from 0000–1999, courses in sociological theory from 2000–2100, courses in sociological methods from 2100-2199, intermediate courses from 2000–2999, advanced courses in the 3000s, and individual study and research courses in the 4000s.

PREREQUISITE

There are no prerequisites for the Sociology major. Completing either a first-year seminar or one introductory course by the end of the sophomore year is recommended.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for Sociology major requirements.

Students in the standard major get broad exposure to the sociological imagination, methods, and substantive areas of inquiry. Students are provided with theory and methods used to diagnose and resolve social problems, understand and analyze social processes, and describe and investigate collective behavior and its determinants. Requirements for the standard major include the following:

1. Thirteen term courses in sociology (including the senior requirement). At least one must be an introductory Sociology course, but no more than two introductory courses may count toward the total.
2. Two courses in sociological theory (SOCY 2001 and 2002)
3. One course in research design (SOCY 2100), usually completed in spring of junior year.
4. One course in a social science methodology (e.g., S&DS 1000, 1100, or 3630).
5. The senior requirement

Students are held to the concentration-specific requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2024-2025, may be fulfilled by students who declared the major in a prior term.

Concentration: Economy and Society Students in the Economy and Society concentration gain a broad understanding of the social dimensions of economic behavior, including the relational dimensions of market interactions, the relationship between the state and markets, religious and cultural effects, valuation processes, social networks, and the causes and consequences of inequality and discrimination in markets. Requirements for the concentration include the following:

1. Thirteen term courses in sociology (including the senior requirement). Up to four courses relevant to the concentration (i.e. economic processes and/or their social dimension) may be drawn from outside the Sociology department with approval from the DUS.
2. One course in sociological theory (SOCY 2001 or SOCY 2002)
3. One course in research design (SOCY 2100), usually completed in spring of junior year.
4. One intermediate or advanced course in microeconomics (e.g. ECON 2121 or ECON 2125)
5. One course in a social science methodology (e.g., S&DS 1000, 1100, or 3630).
6. Two intermediate or advanced courses on inequality or economic sociology (e.g. SOCY 2800, 3814, 3821, or other)
7. The senior requirement, integrating research on markets, businesses, economic behavior, or inequality

Concentration: Health and Society Students in the Health and Society concentration gain a broad understanding of how factors such as socioeconomic inequality, demographic processes, neighborhood environments, cultural norms, and social networks affect health and medical care. Students explore the fields of medical sociology, stratification, demography, and network science. The core courses in the concentration satisfy the social science requirements of premedical programs while also

providing a solid foundation for students interested in public health, health policy, and global health. Requirements for the concentration include the following:

1. Thirteen term courses in sociology (including the senior requirement). Up to five courses relevant to the concentration may be drawn from outside the Sociology department with approval from the DUS.
2. SOCY 1600 or SOCY 1601, the gateway courses for the concentration (or other similar course, with approval of DUS)
3. One course in sociological theory (SOCY 2001 or SOCY 2002)
4. One course in a social science methodology (e.g., S&DS 1000, 1100, or 3630).
5. One course in research design (SOCY 2100), usually completed in spring of junior year.
6. In order to build a broad base of interdisciplinary knowledge on health, students may take up to five course credits from outside the Sociology department, with approval from the DUS. It is recommended that students select at least one course credit from the following: BIOL 1010, 1020, 1030, 1040; MATH 1120 or higher-level MATH course; ECON 2170.
7. Two intermediate or advanced Sociology courses relevant to the concentration
8. The senior requirement, integrating sociology with health and medicine

Concentration: Data and Society Students in the Data and Society concentration gain a broad understanding of the methods used to analyze systematic features of social behavior and the wide range of possible sources that can be used to research social patterns. This concentration focuses on methods of analysis, such as social networks, computational sociology, statistics, computational modeling, natural language processing, and others, but students are expected to also expose themselves to substantive areas of research to gain insight in the application of these methods to social problems. Requirements for the concentration are the following:

1. Thirteen term courses (including the senior requirement). Up to four courses relevant to the concentration may be drawn from outside the Sociology department with approval from the DUS.
2. One course in sociological theory (SOCY 2001 or 2002)
3. One course in research design (SOCY 2100), usually completed in spring of junior year
4. One introductory course in statistics (e.g., S&DS 1000, 1100, 3630, or GLBL 2121).
5. One intermediate or advanced course in statistics (e.g. SOCY 5610, 5620)
6. Two additional methods courses
7. One semester of independent study as a research assistant on a sociological topic, ideally with Sociology faculty
8. The senior requirement, integrating data-intensive approaches to social science

Concentration: Inequality, Race, and Society Students in the Inequality, Race, and Society concentration gain a broad understanding of the ways in which inequality, race, and various forms of discrimination shape society. Inequality will be considered on numerous dimensions including race, ethnicity, gender, sexual orientation, and religion. Requirements for the concentration are the following:

1. Thirteen term courses (including the senior requirement). Two courses relevant to the concentration (i.e. economic processes and/or their social dimension) may be drawn from outside the Sociology department with approval from the DUS.
2. SOCY 1700, the gateway course for the concentration (or other similar course with approval of DUS)
3. One course in sociological theory (SOCY 2001 or 2002)
4. One course in research design (SOCY 2100), usually completed in spring of junior year
5. One course in a social science methodology (e.g., S&DS 1000, 1100, or 3630).
6. Five courses related to race or inequality, up to two from outside the department
7. The senior requirements, integrating research on race and/or inequality

Concentration: Student-Designed This program allows students to combine the study of sociology with the study of another discipline or substantive area and to create a program that satisfies their own interests and career plans. By the beginning of the junior year, participants in the self-designed program are expected to consult with the DUS to obtain approval for their course of study.

1. Thirteen term courses (including the senior requirement).
2. Up to four courses relevant to the concentration (i.e. economic processes and/or their social dimension) may be drawn from outside the Sociology department with approval from the DUS. The courses outside Sociology must constitute a coherent unit alone and form a logical whole when combined with the Sociology courses.
3. Two courses in sociological theory (SOCY 2001 and 2002)
4. One course in research design (SOCY 2100), usually completed in spring of junior year
5. One course in a social science methodology (e.g., S&DS 1000, 1100, or 3630).
6. One intermediate or advanced seminar in Sociology
7. The senior requirement must integrate sociology and the other subject chosen

Credit/D/Fail courses No more than two courses taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENTS

For the non-intensive major Students electing the non-intensive major take one additional seminar in Sociology (SOCY 3000–3999) and write a one-credit senior essay during the senior year (SOCY 4100). The senior essay for non-intensive majors is intended to be an in-depth scholarly review and critical analysis based on secondary sources. Students select an important topic in any sociological field and write a literature review that evaluates what is known about the topic. All non-intensive majors are required to enroll in SOCY 4100 to receive credit for the senior essay. To register for this course, students must submit a written plan of study approved by a faculty adviser to the DUS no later than the end of registration period in the term in which

the senior essay is to be written. Non-intensive majors are not eligible to graduate with Distinction in the Major.

For the intensive major The intensive major gives students an opportunity to undertake a yearlong program of original research resulting in a contribution to sociological knowledge. The yearlong project requires substantial independent research and knowledge of a sociological sub-field. Students use research methods such as data gathering through participant observation, in-depth interviewing, administration of small-scale surveys, or secondary analysis of existing data. They may present findings in a variety of forms, from ethnographic narratives to analytical statistics. Students select primary and secondary advisers from the faculty. Students in the intensive major enroll in SOCY 4200, 4201 during their senior year. The colloquium provides a forum for discussing the research process and for presenting students' research at various stages. Intensive majors are eligible to graduate with Distinction in the Major if they meet the grade standards for Distinction and submit a senior essay written in SOCY 4200, 4201. See The Undergraduate Curriculum, Honors.

ADVISING

All students interested in the Sociology major should meet with the DUS no later than the beginning of the junior year to elect a program of study. Qualified students may petition to enroll in graduate courses, with permission of the instructor and the director of graduate studies. A list of graduate courses and descriptions is available from the DUS.

Admission to the intensive major Candidates for the intensive major should indicate interest to the DUS by registration period in the spring for the fall term of their senior year. The intensive major is especially recommended for students considering graduate school or social research. The DUS and the senior essay adviser serve as advisers to seniors in the intensive major.

STUDY ABROAD

Students planning to study abroad in their junior year are strongly encouraged to begin meeting specific requirements in their sophomore year. They should also discuss the options for their course of study with the DUS before finalizing their plans.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite None

Number of courses 13 term courses (incl senior req) for standard major and all concentrations

Distribution of courses *Standard major*—at least 1, but no more than 2 intro courses, SOCY 2001, 2002, 2100, and a course in sociological methods; *Economy & Society concentration*—SOCY 2001 or 2002, SOCY 2100, 1 intermed or adv course in microeconomics, 1 sociological methods course, 2 intermed or adv courses on inequality or economic sociology; *Health & Society concentration*—SOCY 1600 or 1601, SOCY 2001 or 2002, SOCY 2100, 1 sociological methods course, 2 intermed or adv seminars, relevant to concentration; *Data and Society concentration*—SOCY 2001 or 2002, SOCY 2100, 1 intro stat course, 1 intermed or adv stat course, 2 additional methods courses, 1 indep study; *Inequality, Race, and Society concentration*—SOCY 1700, SOCY 2001 or 2002, SOCY 2100, 1 sociological methods course, 5 courses related to race

or inequality; *Student-designed concentration*—SOCY 2001, 2002, 2100, and a course in sociological methods, 1 intermed or adv sociology course

Substitution permitted *Economy & Society, Data & Society, and Student-Designed concentrations*—up to 4 courses from other depts, with DUS approval; *Health & Society concentration*—up to 5 courses from other depts with DUS approval; *Inequality, Race, and Society concentration*—up to 2 courses from other depts with DUS approval

Senior requirement *Standard major and all concentrations*—1 addtl 3000-level Sociology sem and one-term senior essay SOCY 4100; *Intensive major*—two-term senior essay (SOCY 4200, 4201)

FACULTY OF THE DEPARTMENT OF SOCIOLOGY

Professors Julia Adams, Jeffrey Alexander, Elijah Anderson, †James Baron, Scott Boorman, Nicholas Christakis, †Paul Cleary, Philip Gorski, Grace Kao, †Marissa King, †Peter Salovey, †Vicki Schultz, Philip Smith

Associate Professors Rene Almeling, †Monica Bell, Emily Erikson, †Justin Farrell, †Issa Kohler-Hausmann, Jonathan Wyrtzen

Assistant Professors †Julie DiBenigno, Daniel Karell, †Balázs Kovács, Alka Menon, Rourke O'Brien, Emma Zang

†A joint appointment with primary affiliation in another department or school.

South Asian Studies

Director of undergraduate studies: Jane Lynch (jane.lynch@yale.edu), south.asia@yale.edu

The program in South Asian Studies combines the requirements of a discipline-based first major with significant coursework in South Asian Studies. South Asian Studies can be taken only as a second major. The major is intended to provide students with a broad understanding of the history, culture, and languages of South Asia, as well as the region's current social, political, and economic conditions. Work in a discipline-based major coupled with a focus on South Asia prepares students for graduate study, employment in nongovernmental organizations, or business and professional careers in which an understanding of the region is essential.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the major requirements (premodern South Asia).

In addition to fulfilling the requirements of the primary major, a student choosing South Asian Studies as a second major must complete seven term courses in South Asian Studies numbered 2000 or above. At least two of the seven courses must address premodern South Asia, and at least two should be seminars. Students may petition the director of undergraduate studies (DUS) to include one relevant course from another department or program; approval may require additional coursework on South Asian topics. Students must also complete the senior requirement and meet the major's language requirement.

Language requirement One South Asian language must be studied at the advanced level (L5). Yale offers L5 instruction in Hindi and Sanskrit. Students may request the substitution of another appropriate language (e.g., Persian or Arabic) for the core language requirement, and they are encouraged to pursue intensive language study through courses or work abroad. For South Asian languages beyond Hindi and Sanskrit, proficiency can be demonstrated through testing. Please contact the DUS if this is the route you would like to take. Students who fulfill the major requirement through the successful completion of an L5 language exam must take an additional term course for a total of eight term courses. While the exploration of a second language is encouraged, an elective approved by the DUS will fulfill the requirement.

Credit/D/Fail No more than one course taken Credit/D/Fail may count toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students are held to the senior requirements that were in place when they declared their major. However, with approval from the director of undergraduate studies (DUS), the following requirements, updated for the academic year 2024–2025, may be fulfilled by students who declared the major in a prior term.

The senior requirement may be fulfilled by the completion of a seminar that culminates in a senior essay. Alternatively, the requirement may be fulfilled by completion of a one-credit, one-term senior essay undertaken in consultation with a faculty advisor in SAST 4910. The senior essay can be written in either the fall or spring of the student's senior year. The senior essay should be a substantial paper with a maximum length of 8,000–10,000 words. The use of primary materials in the languages of the region is encouraged in senior essay projects.

The DUS must approve senior requirement plans early in the student's senior year.

ADVISING

The South Asian Studies major permits students to choose courses from a wide range of disciplines. Individual programs should have a balance between courses in the humanities and those in the social sciences. The proposed course of study must be approved each term by the DUS. Students should also identify an adviser from the South Asian Studies faculty in their area of specialization as early as possible.

Two majors Permission to complete two majors must be secured from the Committee on Honors and Academic Standing. Application forms are available from the residential college deans and must be submitted prior to the student's final term.

Courses in the Graduate School Graduate courses in South Asian Studies are open to qualified undergraduates. Course descriptions appear in the Graduate School online bulletin and are also available in the South Asian Studies program office. Permission of the instructor and of the director of graduate studies is required.

STUDY ABROAD

Up to three course credits from approved study abroad programs may be applied toward the requirements of the major, with permission of the DUS.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 7 term courses (not incl senior req or lang req)

Distribution of courses 7 courses in South Asian Studies numbered 2000 or above, 2 in premodern, 2 seminars

Substitution permitted One relevant course in another dept, and/or up to 3 study abroad credits with DUS permission

Language requirement South Asian lang through L5 level

Senior requirement Senior essay in seminar, or research project in SAST 4910

CERTIFICATES OF ADVANCED LANGUAGE STUDY

The Department of South Asian Studies offers a Certificate of Advanced Language Study in Hindi and Sanskrit. A certificate adviser, typically the director of undergraduate studies (DUS), advises students on the certification process. The Certificate of Advanced Language Study, once certified through Degree Audit, is listed on the student's transcript.

REQUIREMENTS FOR THE HINDI CERTIFICATE

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the adviser, one advanced non-L5 Yale course, conducted in the target language, such as an independent study course (graded pass/fail), a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course taught in English to count toward the certification requirements provided the course includes at minimum a weekly discussion section conducted entirely in the target language. The discussion section must enroll a minimum of three students and the course must be designated as LxC in the course description.

The certificate adviser may also approve the substitution of up to two credits earned during study abroad and taught in the target language to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure that those courses appear on their transcripts.

REQUIREMENTS FOR THE SANSKRIT CERTIFICATE

Students seeking to earn the certificate are required to take four courses beyond the L3 level in their chosen language, at least two of which must be Yale courses designated as L5. For the remaining two courses, one must be designated as L5 or L4 and one may be SKRT 5570, a directed reading course, or a course closely related in Old or Middle Indic language, such as Vedic or Pali, or a seminar in Sanskrit literature with the readings in English. All courses must be taken for a letter grade, and students must achieve a grade of B or above.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY ASSOCIATED WITH THE PROGRAM OF SOUTH ASIAN STUDIES

Professors Sunil Amrith (*History*), Tim Barringer (*History of Art*), Veneeta Dayal (*Linguistics*), Mayur Desai (*School of Public Health*, Michael Dove (*Anthropology, School of the Environment*), David Engerman (*History, Global Affairs),* Robert Jensen (*Economics*), Mushfiq Mobarak (*Economics, School of Management*), Bhramar Mukherjee (*School of Public Health*), Kaivan Munshi (*Economics*), Rohini Pande (*Economics*), Kishwar Rizvi (*History of Art*), Kalyanakrishnan Sivaramakrishnan (*Anthropology, School of the Environment*), Kalindi Vora (*Women's, Gender, & Sexuality Studies, Ethnicity, Race, & Migration),* Steven Wilkinson (*Political Science*)

Associate Professors Anthony Acciavatti (*Architecture*), Rohit De (*History*), Zareena Grewal (*Ethnicity, Race, & Migration*)

Assistant Professors Supriya Gandhi (*Religious Studies*), Sonam Kachru (*Religious Studies*), Jane Mikkelson (*Humanities*), Priyasha Mukhopadhyay (*English*), Ameera Nimjee (*Music*), Madiha Tahir (*American Studies*), Brian Wahl (*School of Public Health*)

Senior Lecturers Carol Carpenter (*Anthropology, School of the Environment*), Shilarna Stokes (*Theater, Dance, & Performance Studies*)

Lecturers Jane Lynch (*Anthropology*), Sushant Singh (*South Asian Studies*), Nafeesa Syeed (*English, South Asian Studies*)

Senior Lectors Swapna Sharma (*Hindi*), Aleksandar Uskokov (*Sanskrit*)

Lector Mansi Bajaj (*Hindi*),

Southeast Asia Studies

Chair: Erik Harms (erik.harms@yale.edu), 10 Sachem St., 436-4276; program manager: Ei Khin (ei.khin@yale.edu); language program director: Dinny Aletheiani (dinny.aletheiani@yale.edu); macmillan.yale.edu/southeast-asia

The Council on Southeast Asia Studies offers an interdisciplinary program that brings together faculty and students sharing an interest in Southeast Asia and contributes to the curriculum with language courses, a weekly seminar series, periodic conferences, cultural events, and special lectures. Yale maintains extensive library and research collections on Southeast Asia, including online archives of periodicals and newspapers from all parts of the region.

Yale does not offer a degree in Southeast Asia studies, but majors in any department may consult with Council faculty regarding a senior essay on a Southeast Asian topic, and in certain circumstances students who have a special interest in the region may consider a Special Divisional Major. Students interested in pursuing field research or language study in Southeast Asia may apply to the Council for summer fellowship support.

Courses featuring Southeast Asian content are offered each year within a variety of departments and programs, including Anthropology, Ethnicity, Race, and Migration (ER&M), Environmental Studies, History, History of Art, Music, Philosophy, Political Science, and Sociology. A list of courses for the current year can be obtained through the Council office or the Southeast Asia Studies website.

Language instruction at all levels is offered in two Southeast Asian languages, Indonesian and Vietnamese. Other Southeast Asian languages may be available in any given year via video conference through the Yale Shared Course Initiative. Check the Southeast Asia Studies language studies web page for updated information. The Council on Southeast Asia Studies supports language tables and independent study in other Southeast Asian languages through the Directed Independent Language Study program.

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The Department of Southeast Asian Studies offers Certificates of Advanced Language Study in Vietnamese and Indonesian, which once certified, are listed on student transcripts.

REQUIREMENTS FOR THE VIETNAMESE CERTIFICATE

Students seeking to earn the certificate are required to take four courses beyond the L4 level (VIET 1420), at least two of which must be Yale courses designated as L5 (VIET 1500, 1600, 4600). All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the certificate adviser, up to two advanced non-L5 Yale course, conducted in the target language, such as an independent study course (VIET 4700 or 4710) (graded Pass/Fail) or an advanced seminar may count toward certification requirements. Only one independent study course with Pass/Fail will be counted toward the certificate requirement.

The certificate adviser may also approve the substitution of up to two credits earned during study abroad and taught in the target language to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure that those courses appear on their transcripts.

REQUIREMENTS FOR THE INDONESIAN CERTIFICATE

Students seeking to earn the certificate are required to take four courses beyond the L4 level. At least two of the four courses must be Yale advanced language courses, such as INDN 1500, INDN 1600, INDN 1700, or INDN 1800. All courses must be taken for a letter grade, and students must achieve a grade of B or above. With the approval of the certificate adviser, up to one course, conducted in the target language, at the appropriate advanced level, such as an independent study course (INDN 4700 or INDN 4710), graded Pass/Fail or a graduate seminar (INDN 5700) may count toward certification requirements.

The certificate adviser may also approve the substitution of up to two credits earned during study abroad and taught in the target language to count toward the certificate requirements. If the adviser approves courses taken outside of Yale for inclusion in the certificate requirements, students must take the necessary steps to ensure that those courses appear on their transcripts.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

For more information, email the Southeast Asia Language Director at dinny.aletheiani@yale.edu

FACULTY ASSOCIATED WITH THE COUNCIL ON SOUTHEAST ASIA STUDIES

Professors Sunil Amrith (*History*), Michael R. Dove (*School of the Environment*), Erik Harms (*Anthropology*), Mimi Yiengpruksawan (*History of Art*)

Assistant Professors Alka Menon (*Sociology*), Nurfadzilah Yahaya (*History*)

Senior Lecturers Carol Carpenter (*School of the Environment, Anthropology*), Amity Doolittle (*School of the Environment*)

Lecturer Quan T. Tran (*American Studies*)

Curator Ruth Barnes (*Art Gallery*)

Senior Lector II Quang Phu Van (*Vietnamese*)

Senior Lectors Dinny Risri Aletheiani (*Indonesian*), Indriyo Sukmono (*Indonesian*)

Spanish

Director of undergraduate studies: Aurelie Vialette (aurelie.vialette@yale.edu); language program director: Jorge Méndez-Seijas; span-port.yale.edu

The Department of Spanish and Portuguese provides instruction in the languages, literatures, and cultures of the Hispanic and Luso-Brazilian worlds. Courses in Portuguese and the requirements of the major are described under Portuguese; the names of faculty teaching Portuguese courses are included in the faculty roster.

The major in Spanish is a liberal arts major that offers a wide range of courses in the language, literatures, and cultures of the twenty Spanish-speaking countries in Europe, Latin America, and the Caribbean. Today, Spanish is the second language of the United States, one of the three most widely spoken languages in the world, and one of the five diplomatic languages of the United Nations. The program in Spanish offers students the opportunity to acquire thorough linguistic proficiency as well as in-depth knowledge of both cultural and literary topics. The major explores literature, history, philosophy, art, and cultural studies, and provides excellent preparation for careers in law, diplomacy, medicine, business, the arts, academics, journalism, and education.

COURSE NUMBERING

Courses numbered SPAN 1100–1999 include beginning and intermediate language courses designed to help students develop fluency in understanding, speaking, reading, and writing Spanish. Courses numbered SPAN 2200–2999 seek to provide students with a broad but solid introduction to the fields of Hispanic literatures and cultures while strengthening their linguistic competence. Courses numbered 3000–4999 allow students to perfect their linguistic and critical skills through study of a specific problem or issue, e.g., a literary genre, a type of literary or cultural representation, or a specific writer or text. Students desiring more information about either language or literature offerings should consult the director of undergraduate studies (DUS).

PREREQUISITE

Prerequisite to the major is SPAN 1400, SPAN 1450, SPAN 1500, or the equivalent through advanced placement or study abroad. Equivalent preparation to SPAN 1400, SPAN 1450, SPAN 1500, or may be demonstrated by the test scores indicated below under "Language Courses and Placement Procedures."

LANGUAGE COURSES AND PLACEMENT PROCEDURES

Students with no previous formal or informal Spanish study ordinarily enroll in SPAN 1100. Students who take SPAN 1100 are strongly encouraged to continue with SPAN 1200 in the following term. Students wishing to take intensive beginning Spanish may, with the instructor's permission, enroll in SPAN 1250, which covers the same material as SPAN 1100 and SPAN 1200, but in one term. SPAN 1500 is designed for heritage speakers and is available only to them. Admission to SPAN 1500 is based on the results of the departmental placement examination; interested students should contact the instructor.

All students, including native speakers, who have previously studied Spanish formally or informally must take the departmental placement examination to enroll in a Spanish course. The only exception to this rule is made for students who have demonstrated

advanced ability in the language by (1) receiving a score of 5 on either of the Spanish Advanced Placement tests; (2) receiving a score of 6 or 7 on the Advanced-Level International Baccalaureate examination; or (3) attaining a proficiency level of C1 in the Common European Framework of Reference for Languages. These students may enroll directly in any L5 course.

Information about the departmental placement examination and registration procedures for Spanish L1–L4 language courses is available on the department website.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2024–2025, may be fulfilled by students who declared the major in a prior term.

See the Link to the attribute indicating courses taught in Spanish.

Beyond the prerequisite, ten term courses are required. SPAN 2200 is a required introductory course. Additionally, two courses numbered SPAN 2200–2999 are required, as are three courses numbered SPAN 3000 or higher. SPAN 4900, The Senior Project, is one of the ten required courses. The remaining three elective courses must be numbered SPAN 2000 or higher, or be a first-year seminar taught in Spanish. A maximum of one course taught in a language other than Spanish may also count toward the major requirements, with the approval of the DUS.

Intensive major Students in the intensive major fulfill the requirements for the standard major, and take two additional courses numbered SPAN 3000 or higher.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Seniors complete the senior requirement, an essay or its equivalent in another medium, in SPAN 4900 in the spring of their senior year under the individual direction of a faculty adviser. Students expecting to complete their degree requirements in December complete the senior requirement in SPAN 4900 in the fall of their senior year. Deadlines and guidelines for the senior requirement can be found on the Spanish and Portuguese department website.

ADVISING

Two majors Students electing Spanish as one of two majors should consult the DUS about a specialized course of study.

Courses in the Graduate School Juniors and seniors majoring in Spanish may, with permission of the instructor and the director of graduate studies, enroll in graduate courses in Spanish.

STUDY ABROAD

Students at the intermediate level of language study are encouraged to apply to the eight-week summer language courses offered by Yale Summer Session in New Haven and Bilbao, Spain, or in Quito, Ecuador. Advanced students may apply for the five-week Yale Summer Session courses offered in Valencia, Spain, and in Quito, Ecuador. More information about these programs is available on the Yale Summer Session website. For information about the Year or Term Abroad program, see Academic Regulations, section K, Special Academic Programs. Students who wish to count courses taken abroad toward the major should consult with the DUS before going abroad.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite 1 course from SPAN 1400, 1450, 1500, or equivalent

Number of courses 10 term courses (including senior requirement)

Specific course required SPAN 2200

Distribution of courses 2 courses numbered SPAN 2200-2999, 3 courses numbered SPAN 3000 or higher; 3 electives numbered SPAN 2000 or higher or a first-year seminar taught in Spanish, with a max of one course taught in a language other than Spanish, with DUS approval

Senior requirement SPAN 4900

Intensive major 2 addtl courses numbered SPAN 3000 or higher, totaling 12 term courses

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The Department of Spanish and Portuguese offers a Certificate of Advanced Language Study in Spanish. A certificate adviser, typically the director of undergraduate studies (DUS), advises students on the certification process. The Certificate of Advanced Language Study, once certified, is listed on the student's transcript.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses, all beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5, and at least one of which must be a Yale 3000-level advanced undergraduate lecture or seminar. All courses must be taken for a letter grade, and students must achieve a grade of B or above.

Yale study abroad courses designated as L5 may count toward the certificate. The certificate adviser may also approve the substitution of one credit earned as part of a non-Yale study abroad program and taught in the target language to count toward the certificate requirements. If the adviser approves a non-Yale course for inclusion in the certificate requirements, students must take the necessary steps to ensure that those courses appear on their transcripts.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

Declaration of Candidacy
Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

FACULTY OF THE DEPARTMENT OF SPANISH AND PORTUGUESE

Professors Santiago Acosta, Aníbal González-Pérez, K. David Jackson, Nicholas R. Jones, Olivia Lott, Noël Valis, Jesús R. Velasco, Aurélie Vialette, Lisa Voigt.

Senior Lectors II Jorge Méndez-Seijas.

Senior Lectors I María Pilar Asensio-Manrique, Carolina Baffi, Mercedes Carreras, Sebastián Díaz, María de la Paz García, María José Gutiérrez Barajas, Rosamaría León, Luna Nájera, Juliana Ramos-Ruano, Lissette Reymundi, Noelia Sánchez-Walker, Lourdes Sabé-Colom, Giseli Tordin, María M. Vázquez.

Lectors Mariana Centanin Bertho, Igor de Souza, Kevin Ennis, Sarah Glenski, Mayte López, Ian Russell.

Senior Lecturer II Alex Gil.

Special Divisional Majors

Director of undergraduate studies: Sarah Mahurin (sarah.mahurin@yale.edu), Dean's Office TD, 432-0754

A Special Divisional Major affords an alternative for students whose academic interests cannot be met by an existing departmental or special major. Students may, with the approval of the Committee on Honors and Academic Standing, design majors of their own in consultation with members of the faculty and in accordance with the procedures outlined below.

Special Divisional Majors differ so widely in content that there is no uniform format, but many of these majors draw from several departments to focus on a particular culture, period, or problem (e.g., French studies, medieval studies, urban studies). Students interested in pursuing a Special Divisional Major in Early Modern studies should visit the Early Modern Studies program website. A Special Divisional Major may not be offered as one of two majors.

Students considering a Special Divisional Major should be aware of its particular demands and risks. They face the challenges of interdisciplinary work and must grapple with the conceptual processes of disparate disciplines. They must establish criteria for selecting courses and organize their courses in order to obtain an adequate base in the fields necessary for advanced work on a specific topic.

Students in a Special Divisional Major may get little help in designing their programs. Because they are in separate, independent programs, they forfeit some of the services normally provided as part of a departmental or special major. They must, for example, find their own advisers. They need to ask the help of faculty members already committed to other departments and programs who may not share their interdisciplinary interests. They must acquire the necessary background and sustain their interest without the help of any special seminar. They may lose other advantages of departmental affiliation, such as priority for acceptance in restricted-enrollment courses, opportunities to meet students and faculty members with similar interests, and participation in a program easily understood by graduate schools and others. Their transcripts will carry only the notation "Special Divisional Major," without specifying the student's field of concentration.

Before applying for a Special Divisional Major, students are urged to consult the directors of undergraduate studies (DUSs) in their fields of major interest, who can advise them whether a Special Divisional Major is necessary. Special interests can usually be accommodated within an existing major.

PREREQUISITES

Because of the variety of programs, there are no uniform prerequisites. All students must satisfy their prospective advisers and the Committee that they have obtained adequate preparation for the advanced courses and senior projects they propose.

REQUIREMENTS OF THE MAJOR

The major ordinarily comprises at least twelve advanced term courses and a senior project. Advanced courses include all but prerequisites for majors, beginning language courses, and comparable courses. When appropriate, approval is granted for graduate

courses, tutorials, and Residential College Seminars. No distinction is made in the Special Divisional Major between standard and intensive majors.

The DUS in the Special Divisional Major presents proposals for the major to the Committee on Honors and Academic Standing. General problems connected with a student's program may be discussed with the DUS. Students who revise their original proposal or change faculty advisers must obtain the Committee's approval. The Committee advises the Yale College Faculty whether or not the student has completed a major and may not be able to recommend students for the degree who have changed their programs without proper consultation.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

No later than midterm of their seventh term of enrollment, and after consultation with their faculty advisers, students provide the Committee with an outline of their plans for the senior project. There are several options: a written or oral examination, a senior essay or project, or, in some circumstances, a graduate course or a tutorial. A senior essay usually offers the most effective means of integrating material from more than one discipline, and students in a Special Divisional Major typically request one course credit in each term of the senior year in SPEC 4910, SPEC 4920, The Senior Project.

Students who offer a yearlong senior project must, in order to continue the course into the second term, provide their advisers with substantial written evidence of their progress (i.e., a draft or detailed outline) by the end of their seventh term. The project must be completed no later than two weeks before the last day of classes in the student's eighth term of enrollment. At least two faculty members evaluate it.

ADVISING AND APPLICATION TO THE MAJOR

Advisers Candidates must arrange for faculty advisers before applying. DUSs or department chairs can usually suggest advisers. The Committee expects each student to obtain a primary adviser from the department that forms the principal component of the major, as well as one or more adjunct advisers from other fields. The primary adviser must be a regular member of the Yale College faculty. Members of the faculties of other schools of the University and visiting faculty members may serve as adjunct advisers.

Both advisers and students assume special responsibilities when designing and completing a major that falls outside existing programs. The special nature of the program and the student's loss of departmental affiliation make it particularly important for the faculty adviser to meet regularly with the student to help plan the program and to supervise its completion, including the senior project.

The primary adviser assumes chief responsibility for reporting the student's progress to the Committee and for assigning a grade to the senior project. The primary adviser also consults the student's other advisers and works with them in directing, evaluating, and grading the senior project.

Application Students considering a Special Divisional Major are invited to talk with DUSs and with their residential college deans at any stage in their planning. Candidates may apply for admission as early as their fourth term of enrollment, but must have done so no later than one month after their seventh term of enrollment begins. The Committee's experience suggests that the last term of the sophomore or the first term of the junior year is the best time to apply.

Lucidity, coherence, and completeness in an application are of primary importance to a student's candidacy, since they are indications of a thoughtfully prepared program of study and of the qualities of eagerness and initiative essential to a successful Special Divisional Major. The Committee expects that applicants will have worked in close collaboration with the director of undergraduate studies (DUS) of the Special Divisional Major in developing their proposals, and it will normally view failure to do so as grounds for rejection of the application.

Application forms are available at the Timothy Dwight College Dean's Office. They are submitted, along with letters of support from faculty advisers, to the Committee on Honors and Academic Standing, in care of the Timothy Dwight College Dean's Office. The Committee meets to consider proposals several times a year. All students in good standing are eligible, although the Committee must be satisfied that candidates have particular aptitude and preparation for the work they propose.

In approving or rejecting proposals for a Special Divisional Major, the Committee looks principally at the quality of the student's planning. What are the objectives of the program? What are the principles for selecting courses and organizing material? Is the program comparable in breadth and depth to other majors in Yale College? What provisions have been made to guide and evaluate the student's progress? What sort of senior project would focus and integrate the program? Finally, are the objectives of the program best served by a Special Divisional Major? The Committee will not approve a major if the student can accomplish the desired aims in an existing major; the Committee may consult DUSs and other faculty members to judge whether or not this is the case.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite Approval of 2 or more faculty advisers and Committee on Honors and Academic Standing

Number of courses 13 term courses (incl one-term senior essay) or 14 term courses (incl two-term senior essay)

Distribution of courses Advanced courses in 2 or more appropriate depts; grad courses, college sems, or tutorials with DUS permission

Senior requirement Senior essay or project (SPEC 4910 and/or SPEC 4920), or, with DUS permission, written or oral exam, grad course, or tutorial

Statistics and Data Science

Directors of undergraduate studies: Sekhar Tatikonda (sekhar.tatikonda@yale.edu) and Brian MacDonald; (brian.macdonald@yale.edu) statistics.yale.edu; Major FAQ and guide; undergraduate major checklist

Statistics is the science and art of prediction and explanation. The mathematical foundation of statistics lies in the theory of probability, which is applied to problems of making inferences and decisions under uncertainty. Practical statistical analysis also uses a variety of computational techniques, methods of visualizing and exploring data, methods of seeking and establishing structure and trends in data, and a mode of questioning and reasoning that quantifies uncertainty. Data science expands on statistics to encompass the entire life cycle of data, from its specification, gathering, and cleaning, through its management and analysis, to its use in making decisions and setting policy. This field is a natural outgrowth of statistics that incorporates advances in machine learning, data mining, and high-performance computing, along with domain expertise in the social sciences, natural sciences, engineering, management, medicine, and digital humanities.

Students majoring in Statistics and Data Science take courses in both mathematical and practical foundations. They are also encouraged to take courses in the discipline areas listed below.

The B.A. in Statistics and Data Science is designed to acquaint students with fundamental techniques in the field. The B.S. prepares students to participate in research efforts or to pursue graduate school in the study of data science.

COURSES FOR NONMAJORS AND MAJORS

S&DS 1000, 1090, and 1230 (YData) assume knowledge of high-school mathematics only. S&DS 1080 requires some previous coursework in statistics such as high school AP Statistics. Students who complete one of these courses should consider taking S&DS 2300. This sequence provides a solid foundation for the major. Other courses for nonmajors include S&DS 1100 and S&DS 1600.

PREREQUISITES

Multivariable calculus is required and should be taken before or during the sophomore year. This requirement may be satisfied by one of MATH 1200, ENAS 1510, MATH 3020, or the equivalent.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for the Statistics and Data Science major requirements.

Students who wish to major in Statistics and Data Science are encouraged to take S&DS 2200 or a 1000-level course followed by S&DS 2300. Students should complete the calculus prerequisite and linear algebra requirement (MATH 2220 or MATH 2250 or MATH 2260) as early as possible, as they provide mathematical background that is required in many courses.

B.A. degree program The B.A. degree program requires eleven courses, ten of which are from the seven discipline areas described below: MATH 2220 or MATH 2250 or

MATH 2260 from Mathematical Foundations and Theory; two courses from Core Probability and Statistics; two courses that provide Computational Skills; two courses on Methods of Data Science; and three courses from any of the discipline areas subject to DUS approval. The remaining course is fulfilled through the senior requirement.

B.S. degree program The B.S. degree program requires fourteen courses, including all the requirements for the B.A. degree. Specifically, B.S. degree candidates must take S&DS 2420 and S&DS 3650 to fulfill the B.A. requirements. The three remaining courses include one course chosen from the Mathematical Foundations and Theory discipline and two courses chosen from Core Probability and Statistics (not including S&DS 2420), Computational Skills, Methods of Data Science (not including S&DS 3650), Mathematical Foundations and Theory, or Efficient Computation and Big Data discipline areas subject to DUS approval.

Discipline Areas The seven discipline areas are listed below.

Core Probability and Statistics These are essential courses in probability and statistics. Every major should take at least two of these courses, and should probably take more. Students completing the B.S. degree must take S&DS 2420.

Examples of such courses include: S&DS 2380, S&DS 2410, S&DS 2420, S&DS 3120, S&DS 3510

Computational Skills Every major should be able to compute with data. While the main purpose of some of these courses is not computing, students who have taken at least two of these courses will be capable of digesting and processing data. While there are other courses that require more programming, at least two courses from the following list are essential.

Examples of such courses include: S&DS 2200 or S&DS 2300, S&DS 2620, S&DS 2650, S&DS 4250, CPSC 1001, or CPSC 2010 or ENAS 1300

Methods of Data Science These courses teach fundamental methods for dealing with data. They range from practical to theoretical. Every major must take at least two of these courses. Students completing the B.S. degree must take S&DS 3650.

Examples of such courses include: S&DS 3120, S&DS 3170, S&DS 3610, S&DS 3630, S&DS 3650, S&DS 4300, S&DS 4310, S&DS 4680, ECE 4000, CPSC 4460, CPSC 4520, CPSC 4770

Mathematical Foundations and Theory All students in the major must know linear algebra as taught in MATH 2220 or MATH 2250 or MATH 2260. Students who have learned linear algebra through other courses may substitute another course from this category. Students pursuing the B.S. degree must take at least two courses from this list and those students contemplating graduate school should take additional courses from this list as electives.

Examples of such courses include: S&DS 3640, S&DS 4000, S&DS 4100, S&DS 4110, CPSC 3650, CPSC 3660, CPSC 4690, MATH 2220, MATH 2250, MATH 2260, MATH 2440, MATH 2550, MATH 2560, MATH 2600, or MATH 3020

Efficient Computation and Big Data These courses are for students focusing on programming or implementation of large-scale analyses and are not required for the

major. Students who wish to work in the software industry should take at least one of these.

Examples of such courses include: CPSC 2230, CPSC 3230, CPSC 4240, CPSC 4381

Data Science in Context Students are encouraged to take courses that involve the study of data in application areas. Students learn how data are obtained, how reliable they are, how they are used, and the types of inferences that can be made from them. These course selections should be approved by the director of undergraduate studies (DUS).

Examples of such courses include: ANTH 3476, EVST 3620, GLBL 3191, 3195, LING 3290, 2340, 3800, PSYC 2658

Methods in Application Areas These are methods courses in areas of applications. They help expose students to the cultures of fields that explore data. These course selections should be approved by the DUS.

Examples of such courses include: CPSC 4530, CPSC 4700, CPSC 4750, ECON 2136, ECON 4420, EENG 445, S&DS 3520, LING 2270

Substitution Some substitution, particularly of advanced courses, may be permitted with DUS approval.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students in both the B.A. degree program and B.S. degree program complete the senior requirement by completing an individual research project. Courses for research opportunities include S&DS 4910 or S&DS 4920 (but not both), and must be advised by a member of the department of Statistics and Data Science or by a faculty member in a related discipline area.

ADVISING

Students intending to major in Statistics and Data Science should consult the department guide and FAQ. Statistics and Data Science can be taken either as a primary major or as one of two majors, in consultation with the DUS. Appropriate majors to combine with Statistics and Data Science include programs in the social sciences, natural sciences, engineering, computer science, or mathematics. A statistics concentration is also available within the Applied Mathematics major.

Combined B.S./M.A. degree program Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.S. in S&DS and M.A. in Statistics after eight terms of enrollment. See Academic Regulations, section L, Special Academic Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees." Interested students should consult the DUS at the beginning of their fifth term of enrollment for specific requirements in Statistics and Data Science.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites *Both degrees*—one of MATH 1200, ENAS 1510, MATH 3020, or equivalent

Number of courses *B.A.*—11 term courses beyond prereqs (incl senior req); *B.S.*—14 term courses beyond prereqs (incl senior req)

Specific courses required *B.A.*—MATH 2220 or MATH 2250 or MATH 2260; *B.S.*—same as B.A. degree, although 1 Core Probability and Statistics course must be S&DS 2420 and 1 Methods of Data Science course must be S&DS 3650

Distribution of courses *B.A.*—2 courses from Core Probability and Statistics, 2 courses from Computational Skills, 2 courses from Methods of Data Science, and 3 electives chosen from any discipline area with DUS approval; *B.S.*—same, plus 1 Mathematical Foundations and Theory course and 2 additional electives from any discipline area (except Data Science in Context and Methods in Application Areas) with DUS approval

Substitution permitted With DUS approval

Senior requirement *Both degrees*—Senior Project (S&DS 4910 or S&DS 4920)

CERTIFICATE IN DATA SCIENCE

The Certificate in Data Science is designed for students majoring in disciplines other than Statistics and Data Science to acquire the knowledge to promote mature use of data analysis throughout society. Students gain the necessary knowledge base and useful skills to tackle real-world data analysis challenges. Students who complete the requirements for the certificate are prepared to engage in data analysis in the humanities, social sciences, and sciences and engineering and are able to manage and investigate quantitative data research and report on that data.

Refer to the S&DS website for more information. Students must declare their intent to earn a certificate by the last day of add/drop period in their final term of enrollment. This is done on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub. Once declared, Degree Audit will track students' progress toward completion of the certificate.

PREREQUISITE

The suggested prerequisite for the certificate is an introductory course, selected from one of the following courses: S&DS 1000, 1080, 1090, or 1230, or an introductory data analysis course from another department.

REQUIREMENTS OF THE CERTIFICATE

See Links to courses approved for the statistical data analysis requirements.

To fulfill the requirements of the certificate, students must take five courses from four different areas of statistical data analysis. No course may be applied to satisfy the requirements of both a major and the certificate. No single course may count for two areas of study. Students are required to earn at least a B– for each course.

Probability and Statistical Theory One from S&DS 2380, S&DS 2400, S&DS 2410, S&DS 2420. Advanced students may substitute S&DS 3510 or S&DS 3640 or ECE 4310.

Students are held to the Statistical Methodology and Data Analysis requirements that were in place when they declared their intent to earn the S&DS Certificate. However, with approval from the director of undergraduate studies (DUS), the following requirements, updated for the academic year 2024–2025, may be fulfilled by students who declared their intent to earn the certificate in a prior term.

Statistical Methodology and Data Analysis Two from S&DS 2200 or S&DS 2300 (but not both), S&DS 2420, S&DS 3120, S&DS 3610, S&DS 3630, PLSC 2501. ECON 2136 may be substituted for S&DS 2420.

Computation & Machine Learning One from S&DS 2620, S&DS 2650, S&DS 3170, S&DS 3650, CPSC 2230, CPSC 3810, CPSC 4770, PHYS 3780, PLSC 5060, CPSC 3230 may be substituted for CPSC 2230.

Data Analysis in a Discipline Area One course from those approved for this requirement and listed on the S&DS website.

ADVISING

More information about the certificate, including how to register, is available on the S&DS website.

SUMMARY OF REQUIREMENTS

Prerequisite 1 term course from S&DS 1000, 1080, 1090, or 1230 (or an introductory data analysis course in another department)

Number of courses 5 term courses

Distribution of courses 1 probability and statistical theory course; 2 statistical methodology and data analysis courses; 1 computational and machine learning course; and 1 course in discipline area, as specified

FACULTY OF THE DEPARTMENT OF STATISTICS AND DATA SCIENCE

Professors †Donald Andrews, †P. M. Aronow, Andrew Barron, †Jeffrey Brock, Joseph Chang, †Katarzyna Chawarska, †Xiaohong Chen, Yuejie Chi, †Nicholas Christakis, †Ronald Coifman, †James Duncan, John Emerson (*Adjunct*), †Alan Gerber, †Mark Gerstein, Anna Gilbert, John Hartigan (*Emeritus*), †Edward Kaplan, †Harlan Krumholz, John Lafferty, Zongming Ma, David Pollard (*Emeritus*), †Nils Rudi, Jasjeet Sekhon, †Donna Spiegelman, Daniel Spielman, †Hemant Tagare, †Van Vu, Yihong Wu, †Heping Zhang, †Hongyu Zhao, Harrison Zhou, †Steven Zucker

Associate Professors †Forrest Crawford, Zhou Fan, †Joshua Kalla, †Amin Karbasi, †Vahideh Manshadi, Sekhar Tatikonda

Assistant Professors Elisa Celis, Sinho Chewi, †Melody Huang, Roy Lederman, Shuangping Li, Lu Lu, Theodor Misiakiewicz, Omar Montasser, †Dustin Scheinost, †Ramina Sotoudeh, †Andre Wibisono, Zhuoran Yang, †Ilker Yildirim, Ilias Zadik

Senior Lecturers †William Casey King, Brian Macdonald, Ethan Meyers, Jonathan Reuning-Scherer

Lecturer Robert Wooster

Preceptors Lynda Aouar, Addison McGhee, Shivam Sharma, Alberto Stefanelli

†A joint appointment with primary affiliation in another department or school.

Theater, Dance, and Performance Studies

Director of undergraduate studies: Hal Brooks (hal.brooks@yale.edu), Rm. 102C, 220 York St., 432-1310; tdps.yale.edu

The mission of the program in Theater, Dance, and Performance Studies (TDPS) is to cultivate adventurous artists and scholars with a serious commitment to craft and extensive understanding of the contexts in which cultural productions emerge. Introductory, term, and capstone courses reiterate the core learning objectives of the program: collaboration, craft, the integration of practice and theory, interdisciplinarity, and new work development.

Students are encouraged to gain experience in an array of disciplines including theater, dance, performance studies, musical theater, intermedia arts, and design. As research in theater, dance, and performance studies is interdisciplinary in scope and global in perspective, students are expected to take courses in cognate disciplines such as history, philosophy, anthropology, political science, film, art, and literature. The major provides a solid education in the humanities, as well as preparation for graduate studies or for careers in theater, dance, and the performing arts.

Faculty members are affiliated with a range of departments; their diverse expertise lends breadth and depth to course offerings and enables students to devise a course of study that reflects their developing interests. Faculty affiliated with the David Geffen School of Drama at Yale (DGSD) regularly teach Theater, Dance, and Performance Studies (TDPS) courses, and students have ample opportunities to interact with graduate students in the various departments of DGSD. Courses and events across the TDPS curriculum provide opportunities for students to attend performances by professional companies and artists and learn from discussions, workshops, and lectures offered by prominent guest artists and scholars.

Special features of the program are its production seminars, independent studies, research- and writing-based senior theses, and production-based senior projects. Production seminars, taken with the permission of the instructor, offer immersive, semester-long performance research and development, culminating in public presentations and productions. Independent studies, taken under the supervision of a faculty adviser, give students the freedom to pursue individual and group-generated projects and to investigate areas of scholarship not offered elsewhere in the curriculum. Independent study courses are typically open only to juniors and seniors in the major. Production-based senior projects as well as research- and writing-based senior theses are described in the Senior Requirements section.

In addition to the theater, dance, and performance studies curricula, three programs are integrated into the mission of the major.

The **Dance Studies curriculum** features studio and seminar courses that cover the practice, history, and theory of diverse dance forms and movement phenomena. Students are guided in physical techniques and movement research across a wide range of temporal, geographic, and cultural sites, linking dance to the other arts, the humanities, sciences, and social sciences, and they explore the fluid and

fraught relationship between movement and language. Contact: Emily Coates (emily.coates@yale.edu), Director of Dance.

The **Shen Curriculum for Musical Theater** examines American Musical Theater as a unique art form, one informed and influenced by changing cultural and socio-economic conditions as well as musical tastes and styles. Shen courses combine a grounding in skill-based study with history, analysis, and theory. The faculty consists of scholars and working professionals, including composers, directors, lyricists, librettists, directors, and performers. Additionally, the Shen Curriculum supports a co-curricular program that includes the Fridays at Five series of master classes and voice lessons in musical theater technique. Contact: Daniel Egan (dan.egan@yale.edu), Coordinator of the Shen Curriculum.

Computing and the Arts is an interdepartmental major designed for students who wish to work at and across intersections between computing and theater, dance and/or performance studies. Through a mix of practical and theoretical exploration, students consider how the live body on stage is reconfigured, reimagined, and reified through technological intervention. Contact: Elise Morrison (elise.morrison@yale.edu), affiliated faculty in Computing and the Arts.

The Theater, Dance, and Performing Studies department also supports three substantial co-curricular initiatives: the Performance Studies working group, the Yale Playwrights Festival, and the Yale Dance Lab.

PREREQUISITES

The prerequisites for the major are TDPS 1000 and TDPS 1001.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for Theater, Dance, and Performance Studies major requirements.

The major consists of ten term courses beyond the introductory prerequisites. Of the ten required term courses, students must take two courses in each of four domains: Artistic Practice, Interarts, Histories, and Performance Theory, one related elective and one senior requirement course. Most courses are listed in more than one domain, though they may count for only one domain requirement for a given student. Students may take term courses concurrently with prerequisite courses.

Artistic Practice Domain (YC TDPS: Artistic Practice) This domain encompasses techniques and compositional strategies in theater, dance, musical theater, design, and intermedia performance. Practice-based courses emphasize the knowledge of doing, moving, creating, devising, composing, designing, and craft. Courses move through existing aesthetic practices and histories as a means of cultivating individual and collective expression and new creation. Skills: heightened attention to energy, time, and space; the artist's self-knowledge and body; fluency synthesizing movement and language in compositions; and innovative approaches to researching history and culture through performance.

Interarts Domain (YC TDPS: Interarts) This domain invites students to experience art-making between disciplines and within interdisciplinary forms. Courses in this area may draw connections and inspiration between established artistic disciplines, such as theater and dance, or reach beyond the program, putting the performing

arts in conversation with ideas and approaches in diverse fields including film, visual art, new media, psychology, and science. Ideally, students use the Interarts requirement to explore disciplinary practices outside of their main track and comfort zone, expanding the boundaries of methods, resources, and questioning that feed into their creative practice. Skills: collaboration; interdisciplinary research and creation; and the integration of methods and systems of knowledge drawn from diverse fields.

Histories Domain (YC TDPS: Histories) This domain includes courses in which the scope of study is defined by period, genre, and/or geographic region, in which students research past practices, texts, performances, and cultures. Courses in Histories may also ask students to employ performance-based research methods to analyze, discover, reconstruct, or intervene in diverse global, local, and personal historical narratives. Skills: engaging with material from disparate time periods, geographies, and cultural forms; methods of archival research and oral histories; and reenacting historical performance and adaptation in new forms.

Performance Theory Domain (YC TDPS: Performance Theory) Courses in this domain introduce students to foundational theories of performativity and theatricality as applied to a range of cultural contexts and global histories. Theory courses bring together intersecting literatures of feminist and queer theory, linguistic theory, critical race studies, dance studies, and anthropology that together form the theories and methods of Performance Studies and Dance Studies as fields of study and practice. These courses may also invite students to respond to and use theoretical concepts in the creation of live art. Skills: facility with performance studies analysis; application of theory to dramatic texts and embodied practices; and investigating dynamic relationship between archives and repertoires.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Courses graded P/F No course taken Pass/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENTS

Majors are held to the senior requirements that were in place when they declared their major. However, with approval from the director of undergraduate studies (DUS), the following senior requirement options, updated for the academic year 2024–2025, may be fulfilled by students who declared the major in a prior term.

Majors satisfy the senior requirement in one of five main ways: a substantial senior essay written in an upper-level seminar, a production seminar, or a senior independent study (TDPS 4900, TDPS 4901, or TDPS 4902).

With the approval of the DUS, a student may take a one-term, upper-level seminar as a senior seminar. In such cases, the expectations for the final thesis will be substantially higher than for other students not taking the class as a senior seminar. Participation and

enrollment in a production seminar may similarly fulfill the senior requirement, and will similarly require a more extensive final paper than other students in the course.

Under the supervision of a faculty adviser, a student may undertake a one-term senior project in either the fall or spring semester by enrolling in TDPS 4901 which culminates in a production as part of the curricular production season. Depending upon an individual student's preparation, coursework, and research objectives, a senior enrolled in TDPS 4901 may direct, design, or devise a theatrical production, create a documentary film or digital media production, perform a role, choreograph a dance piece, or design an original work of performance art. Seniors engaging in production-based senior projects (TDPS 4901) must complete an essay (15–25 pages in length). For a production-based project to be considered for inclusion in the TDPS curricular season, a proposer must have previously served as a producer of a TDPS curricular production (or partner with someone who has) and must follow the proposal guidelines that are promulgated throughout their junior year.

Under the supervision of a faculty adviser, a student may undertake a one-term senior research project in either the fall or spring semester by enrolling in TDPS 4902 which culminates in a full-length essay (35–50 pages in length), a writing portfolio or other work of performance-based writing (plays, screenplays, etc.). In TDPS 4902 students' research falls into one of these three areas: 1) Literature, History, Theory, and Criticism 2) Writing Performance-based Art and Media, and 3) Performance Research, Analysis and Design. Seniors pursuing this thesis path are permitted to use their curricular thesis research to support their extracurricular work in a production that is organized and funded through the Creative and Performing Arts process or other approved entities. Similar to TDPS 4901, students enrolling in TDPS 4902 must follow the proposal guidelines that are promulgated throughout their junior year.

To ensure that their coursework aligns with their goals, students should begin discussing senior project ideas and plans with the DUS at the start of their junior year. Mandatory senior project orientation meetings for all juniors are held once in the fall and twice during the spring semester, with research and production proposals due the Friday before spring recess.

ADVISING

TDPS majors in their junior and senior years are required to meet with the DUS at the beginning of each of their final four terms. Students in their first and second years of study who may be interested in the TDPS major are encouraged to meet with the DUS once a semester to discuss goals, learn about opportunities, and ask questions.

COURSES REQUIRING INSTRUCTOR PERMISSION

With the exception of TDPS 1000 and TDPS 1001, many courses in Theater, Dance, and Performance Studies are limited enrollment courses that may require a short statement of interest, writing sample, or audition in order to obtain instructor permission to register. When there are more applicants for a course than can be admitted, priority is given to juniors and seniors who have declared a major in Theater, Dance, and Performance Studies or first- and second-year students who have completed one or both prerequisite courses (TDPS 1000 and TDPS 1001). Undergraduate students in all years of study and all majors are encouraged to apply to courses in Theater, Dance, and Performance Studies.

COURSES IN THE DAVID GEFFEN SCHOOL OF DRAMA AT YALE

Majors in Theater, Dance, and Performance Studies are eligible to take DGSD courses in design, theory, dramaturgy, and theater management, with permission of the instructor, the DUS, the DGSD Registrar, using the Cross-School Course Registration Process for the David Geffen School of Drama at Yale. Undergraduates may not, however, enroll in acting or directing courses offered by the David Geffen School of Drama at Yale. Students enrolling in DGSD courses should note that a maximum of four term courses from the professional schools (of which DGSD is one) may be offered toward the bachelor's degree. Students also should note that the academic calendars of DGSD and of Yale College differ. The DGSD calendar should be consulted for scheduling. A student interested in taking a course at the David Geffen School of Drama at Yale should begin by seeking the permission of the instructor and contacting their academic dean.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites TDPS 1000, TDPS 1001

Number of courses 10 term courses beyond prereqs (incl senior req)

Distribution of courses 2 courses in each of four domains: Artistic Practice, Interarts, Histories, Performance Theory; plus 1 related elective.

Senior requirement Senior seminar with substantial final essay, production seminar, or senior independent study (TDPS 4900, 4901, or 4902)

FACULTY ASSOCIATED WITH THE PROGRAM OF THEATER AND PERFORMANCE STUDIES

Professors James Bundy (*School of Drama, Theater, Dance, and Performance Studies*), David Chambers (*Adjunct*) (*Theater, Dance, and Performance Studies*), *Toni Dorfman (*Adjunct*) (*Theater, Dance, and Performance Studies*), Branden Jacobs-Jenkins (*Practice*) (*Theater, Dance, and Performance Studies*), Joan MacIntosh (*Practice*) (*Theater, Dance, and Performance Studies, School of Drama*), *Lawrence Manley (*English*), *Deb Margolin (*Practice) (Theater, Dance, and Performance Studies*), Donald Margulies *(Adjunct) (English, Theater, Dance, and Performance Studies*), *Charles Musser *(Film & Media Studies, American Studies, Theater, Dance, and Performance Studies*), Tavia Nyong'o (*Theater, Dance, and Performance Studies, American Studies*), *Marc Robinson *(School of Drama, Theater, Dance, and Performance Studies, English*), Alexandra Vazquez (*Theater, Dance, and Performance Studies*), Shane Vogel (*African American Studies, English, Theater, Dance, and Performance Studies*), Gregory Wallace *(Practice) (School of Drama, Theater, Dance, and Performance Studies)*

Associate Professor Emily Coates (*Adjunct*) (*Theater, Dance, and Performance Studies, School of Drama*)

Assistant Professors Elise Morrison (*Theater, Dance, and Performance Studies*), Amanda Reid (*Theater, Dance, and Performance Studies*)

Lecturers Hal Brooks, Lacina Coulibaly, Daniel Egan, Grant Herreid, Iréne Hultman, Annette Jolles, Michael Korie, Bronwen MacArthur, Elijah Martinez, Lynda Paul, Emmanuele Phuon, Kelsey Rainwater, Nathan Roberts, Renee Robinson, Michael

Rossmy, Brian Seibert, Dexter Singleton, Sohina Sodhu, Shilarna Stokes, Daniel Ulbricht.

*Member of the Executive Committee for the program.

Translation Studies Certificate

Certificate director: Marijeta Bozovic (marijeta.bozovic@yale.edu), Slavic Languages and Literatures; Film and Media Studies; Women's, Gender, and Sexuality Studies

As human migration and globalization alter the manner and speed of language change, translation has become increasingly central to the workings of the contemporary world. This certificate in Translation Studies promotes the interdisciplinary study of translation, and at the same time facilitates existing and burgeoning translation practices, encompassing literary, social, political, economic, legal, technological, and medical dimensions.

This certificate offers students a coursework-focused track to develop expertise in translation research and practice.

REQUIREMENTS

Students must successfully complete five course credits on translation-themed topics, drawn from the list of approved courses posted each semester on the Translation Studies Initiative website. Other course credits may be approved by permission of the certificate director and the course instructor. In addition, each student must attend three lectures or events listed through the Translation Initiative to be awarded the certificate. After each lecture, students are asked to submit a brief written response to the lecture to the certificate director to be credited for attendance. Other translation activities or other events may be counted toward this requirement at the discretion of the director.

Of the five credits, no more than three may originate in the same department. Additionally, no more than two course credits may overlap in the fulfillment of the requirements of the Translation Studies certificate or of a major, a simultaneous degree, or another certificate; and no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major. Approved graduate and professional school courses may count toward the certificate.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the certificate.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

DECLARATION OF CANDIDACY

Students must declare their intention to earn a Certificate on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub, as early as possible, but at the very latest, by the 15th of January or September in their last semester at Yale. Once declared, Degree Audit tracks students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Number of courses 5 course credits

Distribution of courses Up to 3 courses in any originating department

Additional requirements Attendance at 3 lectures sponsored by the Translation Initiative, each followed by a 1-page written response to the event

Urban Studies

Directors of undergraduate studies: Elihu Rubin (elihu.rubin@yale.edu) [spring 2025]; urbanstudies.yale.edu

Urban Studies is an interdisciplinary field grounded in the physical and social spaces of the city and the larger built environment. The Urban Studies major is situated within Yale's liberal arts framework and draws on the broader academic context and expertise of the Yale School of Architecture, including the areas of urban design and development, urban and architectural history, urban theory and representation, globalization and infrastructure, transportation and mobility, heritage and preservation, and community-based planning. Students have the ability to chart their own course through this interdisciplinary field, but the major emphasizes the following bodies of knowledge: history, theory, and analysis of urban form; the political economy of society and space; conceptual tools and descriptive-analytical methods to understand urban environments; and the theory and practice of urban planning and design.

The major prepares undergraduates for a variety of future careers and fields of graduate study related to urban planning, design, and development. These include professional and practice-oriented fields such as urban planning, landscape architecture, law, nonprofit management, public policy, real estate, and architecture; as well as research-oriented fields such as geography, sociology, anthropology, history and theory of urban planning, and urban and architectural history.

REQUIREMENTS OF THE MAJOR

See Links to the attributes indicating courses approved for Urban Studies major requirements.

Thirteen course credits are required for the major, including the senior requirement. Each student, in consultation with the director of undergraduate studies (DUS) or a departmental faculty adviser, bears the responsibility for designing a coherent program, which must include the following elements: 3 surveys; 3 methods courses; 4, 5, or 6 electives (depending on the credit value of the courses); and a one- or two-term senior requirement.

Surveys Students choose three survey courses from the following list, of which one URBN course is required. Surveys should be completed by the end of the second year. Additional approved survey courses can be searched on Yale Course Search (YC URBN Survey Course).

Surveys: URBN 1300, 1101, 1100, 1102, EVST 3226, ARCH 1001

Methods courses Students must choose an Urban Lab as one of the three required methods courses. The courses in the following lists introduce various methods of understanding and analyzing urbanism and the city. Students should consider completing at least two of these courses by the end of their junior year. Additional approved Urban Lab and Methods courses can be searched on Yale Course Search (YC URBN Urban Lab and YC URBN Methods Course).

Urban Lab Courses: URBN 3601, 3602, 3603, 3604, 3605

Methods Courses: URBN 2000, 3601, 3602, 3603, 3604, 3605, ANTH 3720, EVST 2290

Electives Students choose five electives if enrolling in the two-term senior requirement; six electives if opting for the one-term senior requirement. Each student is responsible for selecting their elective courses from the approved list or by petition of the DUS. Students who take two Urban Labs (1.5 credits each) may take 4–5 electives depending on the selected senior requirement. Additional approved elective courses can be searched on Yale Course Search (YC URBN Elective).

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

All majors must satisfy a senior requirement undertaken during the senior year. Students have the option of pursuing a yearlong senior project, which includes URBN 4900, Senior Research Colloquium, in the fall and URBN 4910, Senior Project, in the spring. The senior project may be a written paper (minimum 7,500 words in the body of the document) or a project that could encompass a variety of media with permission from DUS and the adviser. The primary adviser must be a member of the architecture faculty. Students not choosing a yearlong project may enroll in an advanced seminar (URBN 4000–4910), and produce a final paper of 6,000 words, minimum, in addition to existing coursework. The seminar should be selected in consultation with the DUS. Note that students pursuing the one-term, advanced seminar option must also take an additional elective.

ADVISING AND INTENT TO MAJOR

Students are encouraged to declare their intent to major by the end of their second year, but applications to the major are accepted on a rolling basis. The intent to major process includes submission of an Intent to Major form with requested materials followed by a meeting with the DUS to discuss the intended course of study. Schedules for majors must be discussed with, and approved by, the DUS in Urban Studies.

Courses in the School of Architecture Unless otherwise indicated in the course descriptions, all courses in the School of Architecture are open to majors and nonmajors with permission of the instructor and the graduate registrar. They are not available for the Credit/D/Fail option. Students are admitted on the basis of their previous coursework and previous performance.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 13 course credits (incl senior req)

Distribution of courses 3 surveys, incl 1 URBN course (to be completed by second year); 3 methods courses, one of which must be an Urban Lab; 4–6 electives, as specified and depending on the credit values of the courses selected

Senior requirement URBN 4900 and 4910; or adv seminar and an addtl elective

FACULTY ASSOCIATED WITH URBAN STUDIES

Professors Elijah Anderson (*Sociology*), Keller Easterling (*School of Architecture*), Jennifer Klein (*History*), Marcella Nunez-Smith (*School of Medicine*), Alan Plattus (*School of Architecture*), Karen Seto (*School of Environment*), Helen Siu (*Anthropology*), Jing Tsu (*Comparative Literature, East Asian Languages and Literature*)

Associate Professors Laura Barraclough (*American Studies*), Erik Harms (*Anthropology*), Bill Rankin (*History of Science, Medicine, and Public Health*), Elihu Rubin (*School of Architecture, American Studies*)

Assistant Professors Anthony Acciavatti (*Visiting*) (*School of Architecture*), Joyce Hsiang (*School of Architecture*), Bimal Mendis (*Adjunct*)(*School of Architecture)*

Lecturer Jay Gitlin (*History*)

Critics Marta Caldeira (*School of Architecture*), Andrei Harwell (*School of Architecture*), Surry Schlabs (*School of Architecture*), Beka Sturges (*School of Architecture*)

Women's, Gender, and Sexuality Studies

Director of undergraduate studies: Igor De Souza
(igor.h.desouza@yale.edu); wgss.yale.edu

Genders and sexualities are powerful organizing forces: they shape identities and institutions, nations and economies, cultures, and political systems. Careful study of gender and sexuality thus explains crucial aspects of our everyday lives on both intimate and global scales. Scholarship in Women's, Gender, and Sexuality Studies is interdisciplinary and wide ranging, drawing on history, literature, cultural studies, social sciences, and natural science to study genders and sexualities as they intersect with race, ethnicity, class, nationality, transnational processes, disability, and religion.

Students majoring in Women's, Gender, and Sexuality Studies take a series of core courses, develop an individual area of focus, and write a yearlong or single-term senior essay. The program encourages work that is interdisciplinary, intersectional, international, and transnational. Individual focus areas evolve along with students' intellectual growth and academic expertise. Recent examples of areas of focus include literature and queer aesthetics; transnational feminist practices; the intellectual history of civil rights activism; AIDS health policies; gender, religion, and international NGOs; women's health; food, sexuality, and lesbian community; and gender and sexuality in early education.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements in place when they declared their major. However, with approval from the director of undergraduate studies (DUS), the following requirements, updated for the academic year 2024–2025, may be fulfilled by students who declared the major in a prior term.

Twelve term courses are required and this major may be taken either as a primary major or as one of two majors. Requirements include two intermediate courses selected from WGSS 2205, WGSS 2206, WGSS 2207, or WGSS 3340. Majors are strongly encouraged to take these intermediate courses during their first two years. The major also requires one methodology course, seven courses in an area of focus (one of which must be an upper-level seminar in WGSS numbered 3350 or above) and a two-course senior requirement. The area of focus consists of at least seven courses, the majority of which should be drawn from program offerings. Substitutions to the major requirements may be made only with the written permission of the DUS.

Methodology courses Given its interdisciplinary nature, the Women's, Gender, and Sexuality Studies major necessarily relies on a wide range of methodologies: literary criticism, ethnography, visual analysis, historiography, and quantitative data analysis, among others. Each student is expected to acquire competence in at least one methodology relevant to their area of focus and planned senior essay. Students are advised to take a methodology course by their junior year in preparation for the senior essay. Methodology courses may be drawn from any department, but are subject to DUS approval for WGSS credit.

Credit/D/Fail No more than two courses taken Credit/D/Fail may be applied toward the requirements of the major.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The two-term senior essay The two-term senior sequence consists of WGSS 4490, The Senior Colloquium, in which students begin researching and writing a senior essay, followed by WGSS 4491, The Senior Essay, in which students complete the essay. The senior essay is developed and written under the guidance and supervision of a WGSS-affiliated faculty member with expertise in the area of focus, with a minimum of sixty pages and a maximum of ninety pages (excluding front matter, bibliography and appendices). Students are expected to meet with their essay advisers on a regular basis.

The single-term senior essay Majors may opt to complete the senior essay requirement in an approved upper-level WGSS seminar in the fall or spring term, with the approval of the instructor, by writing a senior essay of at least thirty pages (excluding front matter, bibliography and appendices) in lieu of the course's normal writing requirements. Students who choose the single-term senior essay take one additional WGSS course of their choosing to fulfill the twelve-term-course requirement.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites None

Number of courses 12 term courses (incl senior requirement)

Distribution of courses 2 intermediate courses as indicated; 1 methodology course; 7 electives in area of focus

Senior requirement Senior colloquium and senior essay (WGSS 4490, 4491); or single-term senior essay in an upper-level seminar and one additional elective

FACULTY ASSOCIATED WITH THE PROGRAM OF WOMEN'S, GENDER, AND SEXUALITY STUDIES

Professors Fatima El-Tayeb (*Ethnicity, Race, and Migration*), Roderick Ferguson (*Chair*), Scott Herring (*American Studies*), Margaret Homans (*English*), Regina Kunzel (*History*), Gail Lewis (*Visiting Professor of WGSS*), Dara Strolovitch (*American Studies, Political Science*), Kalindi Vora (*Ethnicity, Race, and Migration*), Laura Wexler (*American Studies*)

Associate Professors Joseph Fischel, Deb Vargas (*Ethnicity, Race, and Migration*)

Assistant Professors Eda Pepi, Evren Savci

Senior Lecturer Maria Trumpler

Lecturers Craig Canfield, Igor De Souza

Affiliated Faculty Julia Adams (*Sociology*), Rene Almeling (*Sociology*), Carol Armstrong (*History of Art*), Daniel Botsman (*History*), Claire Bowern (*Linguistics*), Melanie Boyd (*Yale College, Dean of Student Affairs*), Marijeta Bozovic *(Slavic Languages and Literatures*), Jill Campbell (*English*), Hazel Carby (*Emerita*) (*African American Studies, American Studies*), Kang-i Sun Chang (*East Asian Languages and Literatures*), Becky Conekin (*History*), Deborah Davis (*Sociology, East Asian Studies*), Rohit De (*History*),

Carolyn Dean (*History, French*), Robin Dembroff (*Philosophy*), Kyunghee Eo (*East Asian Languages and Literatures*), Ron Eyerman (*Sociology*), Crystal Feimster (*African American Studies*), Marta Figlerowicz (*Comparative Literature, English*), Moira Fradinger (*Comparative Literature*), Glenda Gilmore (*History*), Jacqueline Goldsby (*African American Studies, American Studies, English*), Gregg Gonsalves (*Law School, Public Health*), Inderpal Grewal (*Emerita*) (*American Studies*), Zareena Grewal (*American Studies, Religious Studies*), Dolores Hayden (*Emerita*) (*School of Architecture, American Studies*), Janet Henrich (*School of Medicine*), Marcia Inhorn (*Anthropology, Global Affairs*), Alice Kaplan (*French*), Jennifer Klein (*History*), Greta LaFleur (*American Studies*), Marianne LaFrance (*Emerita*) (*Psychology*), Hélène Landemore-Jelaca (*Political Science*), Kathryn Lofton (*American Studies, History, Religious Studies*), Lisa Lowe (*American Studies, Ethnicity, Race and Migration*), Mary Lui (*American Studies, History*), Deb Margolin (*Theater Studies*), Alka Menon (*Sociology*), Kobena Mercer (*History of Art, African American Studies*), Joanne Meyerowitz (*American Studies, History*), Alice Miller (*Law School, Public Health*), Elise Morrison (*Theater Studies*), Laura Nasrallah (*Religious Studies*), Priyamvada Natarajan (*Astronomy, Physics*), Tavia Nyong'o (*Theater Studies, American Studies*), John Pachankis (*Public Health*), Sally Promey (*American Studies, Institute of Sacred Music*), Ayesha Ramachandran (*Comparative Literature*), Ana Ramos-Zayas (*American Studies, Ethnicity, Race & Migration*), Judith Resnik (*Law School*), Juno Jill Richards (*English*), Naomi Rogers (*History, History of Science, Medicine & Public Health*), Alicia Schmidt Camacho (*American Studies, Ethnicity, Race & Migration*), William Summers (*Emeritus*) (*Molecular, Cellular, & Developmental Biology, History of Science, Medicine, & Public Health*), George Syrimis (*Hellenic Studies*), Rebecca Tannenbaum (*History*), Linn Tonstad (*Divinity School*), Jing Tsu (*East Asian Languages and Literatures, Comparative Literature*), Claudia Valeggia (*Anthropology*), Noel Valis (*Spanish & Portuguese*), Michael Warner (*English, American Studies*), Elisabeth Wood (*Political Science*)

THE WORK OF YALE UNIVERSITY

The work of Yale University is carried on in the following schools:

Yale College Est. 1701. Courses in humanities, social sciences, natural sciences, mathematical and computer sciences, and engineering. Bachelor of Arts (B.A.), Bachelor of Science (B.S.). 203 432-9300 *https://admissions.yale.edu*

Graduate School of Arts and Sciences Est. 1847. Courses for college graduates. Master of Arts (M.A.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.). 203 432-2771 *https://gsas.yale.edu*

School of Medicine Est. 1810. Courses for college graduates and students who have completed requisite training in approved institutions. Doctor of Medicine (M.D.). Postgraduate study in the basic sciences and clinical subjects. Five-year combined program leading to Doctor of Medicine and Master of Health Science (M.D./M.H.S.). Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D./Ph.D.). Master of Medical Science (M.M.Sc.) from the Physician Associate Program and the Physician Assistant Online Program. 203 785-2643 *https://medicine.yale.edu/edu*

Divinity School Est. 1822. Courses for college graduates. Master of Divinity (M.Div.), Master of Arts in Religion (M.A.R.). Individuals with an M.Div. degree may apply for the program leading to the degree of Master of Sacred Theology (S.T.M.). 203 432-5360 *https://divinity.yale.edu*

Law School Est. 1824. Courses for college graduates. Juris Doctor (J.D.). Graduate Programs: Master of Laws (LL.M.), Doctor of the Science of Law (J.S.D.), Master of Studies in Law (M.S.L.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 432-4995 *https://law.yale.edu*

School of Engineering & Applied Science Est. 1852. Courses for college graduates. Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 432-4252 *https://seas.yale.edu*

School of Art Est. 1869. Professional courses for college and art school graduates. Master of Fine Arts (M.F.A.). 203 432-2600 *http://art.yale.edu*

School of Music Est. 1894. Graduate professional studies in performance and composition. Certificate in Performance (CERT), Master of Music (M.M.), Master of Musical Arts (M.M.A.), Artist Diploma (A.D.), Doctor of Musical Arts (D.M.A.). 203 432-4155 *https://music.yale.edu*

School of the Environment Est. 1900. Courses for college graduates. Master of Forestry (M.F.), Master of Forest Science (M.F.S.), Master of Environmental Science (M.E.Sc.), Master of Environmental Management (M.E.M.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 800 825-0330 *https://environment.yale.edu*

School of Public Health Est. 1915. Courses for college graduates. Master of Public Health (M.P.H.). Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 785-2844 *https://publichealth.yale.edu*

School of Architecture Est. 1916. Courses for college graduates. Professional and post-professional degree: Master of Architecture (M.Arch.); nonprofessional degree: Master of Environmental Design (M.E.D.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 432-2296 *https://www.architecture.yale.edu*

School of Nursing Est. 1923. Courses for college graduates. Master of Science in Nursing (M.S.N.), Post Master's Certificate (P.M.C.), Doctor of Nursing Practice (D.N.P.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 785-2389 *https://nursing.yale.edu*

David Geffen School of Drama Est. 1925. Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, Doctor of Fine Arts (D.F.A.). 203 432-1507 *https://drama.yale.edu*

School of Management Est. 1976. Courses for college graduates. Master of Business Administration (M.B.A.), Master of Advanced Management (M.A.M.), Master of Management Studies (M.M.S.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. *https://som.yale.edu*

Jackson School of Global Affairs Est. 2022. Courses for college graduates. Master in Public Policy (M.P.P) and Master of Advanced Study (M.A.S.). 203 432-6253 *https://jackson.yale.edu*

COURSES

- Accounting (ACCT)
- Aerospace Studies (USAF)
- African American Studies (AFAM)
- African Studies (AFST)
- Akkadian (AKKD)
- American Sign Language (ASL)
- American Studies (AMST)
- Ancient Greek (GREK)
- Anthropology (ANTH)
- Applied Mathematics (AMTH)
- Applied Physics (APHY)
- Arabic (ARBC)
- Archaeological Studies (ARCG)
- Architecture (ARCH)
- Armenian (ARMN)
- Art (ART)
- Astronomy (ASTR)
- Biology (BIOL)
- Biomedical Engineering (BENG)
- Bosnian-Serbian-Croatian (SBCR)
- British Studies (BRST)
- Burmese (BURM)
- Chemical Engineering (CENG)
- Chemistry (CHEM)
- Child Study (CHLD)
- Chinese (CHNS)
- Classical Civilization (CLCV)
- Classics (CLSS)
- Cognitive Science (CGSC)
- Comparative Literature (LITR)
- Computer Science (CPSC)
- Computer Science and Economics (CSEC)
- Computing and the Arts (CPAR)
- Czech (CZEC)
- Directed Studies (DRST)
- Dutch (DUTC)
- Earth and Planetary Sciences (EPS)
- East Asian Languages and Literatures (EALL)

- East Asian Studies (EAST)
- Ecology & Evolutionary Biology (E&EB)
- Economics (ECON)
- Education Studies (EDST)
- Egyptian (EGYP)
- Electrical Engineering (EENG)
- Energy Studies (ENRG)
- Engineering & Applied Science (ENAS)
- English Language and Literature (ENGL)
- Environmental Engineering (ENVE)
- Environmental Studies (EVST)
- Ethics, Politics, & Economics (EP&E)
- Ethnicity, Race, & Migration (ER&M)
- Film and Media Studies (FILM)
- Finnish (FNSH)
- French (FREN)
- German Studies (GMAN)
- Global Affairs (GLBL)
- Global Health Studies (HLTH)
- Hebrew (HEBR)
- Hindi (HNDI)
- History (HIST)
- History of Art (HSAR)
- History of Science, Medicine, and Public Health (HSHM)
- Human Rights Studies (HMRT)
- Humanities (HUMS)
- Hungarian (HGRN)
- Indonesian (INDN)
- Italian Studies (ITAL)
- Japanese (JAPN)
- Jewish Studies (JDST)
- Khmer (KHMR)
- Kiswahili (SWAH)
- Korean (KREN)
- Latin (LATN)
- Latin American Studies (LAST)
- Linguistics (LING)
- Mathematics (MATH)
- Mechanical Engineering (MENG)
- Modern Greek/Hellenic Studies (MGRK)
- Modern Middle East Studies (MMES)

- Modern Tibetan (MTBT)
- Molecular Biophysics and Biochemistry (MB&B)
- Molecular, Cellular, and Developmental Biology (MCDB)
- Music (MUSI)
- Naval Science (NAVY)
- Near Eastern Languages and Civilizations (NELC)
- Neuroscience (NSCI)
- Ottoman (OTTM)
- Persian (PERS)
- Philosophy (PHIL)
- Physics (PHYS)
- Polish (PLSH)
- Political Science (PLSC)
- Portuguese (PORT)
- Psychology (PSYC)
- Punjabi (PNJB)
- Religious Studies (RLST)
- Romanian (ROMN)
- Russian (RUSS)
- Russian, East European, and Eurasian Studies (RSEE)
- Sanskrit (SKRT)
- Science (SCIE)
- Sinhala (SNHL)
- Slavic Languages and Literatures (SLAV)
- Sociology (SOCY)
- South Asian Studies (SAST)
- Spanish (SPAN)
- Special Divisional Major (SPEC)
- Statistics and Data Science (S&DS)
- Study of the City (STCY)
- Tamil (TAML)
- The DeVane Lecture Course (DEVN)
- Theater, Dance, and Performance Studies (THST)
- Tibetan (TBTN)
- Turkish (TKSH)
- Twi (TWI)
- Ukrainian (UKRN)
- Urban Studies (URBN)
- Vietnamese (VIET)
- Wolof (WLOF)
- Women's Gender and Sexuality Studies (WGSS)

- Yoruba (YORU)
- Zulu (ZULU)

Accounting (ACCT)

Aerospace Studies (USAF)

*** USAF 1001a, Heritage and Values of the U.S. Air Force I** Staff
Introduction to the U.S. Air Force and how it works as a military institution, including an overview of its basic characteristics, missions, and organizations. Students attend one 50-minute lecture and one 110-minute laboratory each week. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** USAF 2001a, Team and Leadership Fundamentals I** Staff
This course focuses on laying the foundation for teamwork and leadership, particularly the skills that allow cadets to improve their leadership on a personal level and within a team. The course prepares cadets for their field training experience, where they are able to put the concepts learned into practice. The purpose of this course is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** USAF 3001a, Leading People and Effective Communication I** Staff
Advanced study of leadership concepts and ethics, management and communication skills, and Air Force personnel and evaluation systems. Emphasis on the enhancement of leadership skills. Case studies and exercise of leadership and management techniques in a supervised environment. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** USAF 4011a, Foundations of American Airpower** Staff
This course is an exploration of the evolution and employment of airpower in the United States military. The course is designed to give students an understanding of what role modern airpower plays in the use of national instruments of power; how American airpower has shaped U.S. grand strategy and vice versa. The course traces the development of airpower doctrine and strategy from World War I to modern day. Applications to deterrence theory, the role of technology, counterinsurgency/counterterrorism, and the "information revolution" are discussed.

African American Studies (AFAM)

AFAM 1398a / CGSC 2770a / EDST 1177a / PHIL 1177a, Propaganda, Ideology, and Democracy Staff
Historical, philosophical, psychological, and linguistic introduction to the issues and challenges that propaganda raises for liberal democracy. How propaganda can work to undermine democracy; ways in which schools and the press are implicated; the use of

propaganda by social movements to address democracy's deficiencies; the legitimacy of propaganda in cases of political crisis. HU o Course cr

AFAM 1615b / WGSS 1125b, "We Interrupt this Program: The Multidimensional Histories of Queer and Trans Politics" Roderick Ferguson
In 1991, the arts organizations Visual AIDS and The Kitchen collaborated with video artist and filmmaker Charles Atlas to produce the live television broadcast "We Interrupt this Program." Part educational presentation, part performance piece, the show was aired in millions of homes across the nation. The program, in The Kitchen's words, "sought to feature voices that had often been marginalized within many discussions of AIDS, in particular people of color and women."This course builds upon and is inspired by this aspect of Atlas's visionary presentation, an aspect that used the show to produce a critically multicultural platform that could activate cultural histories and critical traditions from various communities. In effect, the course uses this aspect as a metonym for the racial, gender, sexual, and class heterogeneity of queer art and organizing. It conducts its investigation by looking at a variety of primary materials that illustrate the heterogeneous makeup of queer and trans politics. The course also draws on more recent texts and visual works that arose from the earlier contexts that the primary texts helped to illuminate and shape. HU RP o Course cr

AFAM 1946b / ECON 2171b / EDST 1271b / EDST 271, Urban Inequalities and Educational Inequality Gerald Jaynes
Analysis of contemporary policy problems related to academic under performance in lower income urban schools and the concomitant achievement gaps among various racial and ethnic groups in United States K-12 education. Historical review of opportunity inequalities and policy solutions proposed to ameliorate differences in achievement and job readiness. Students benefit from practical experience and interdisciplinary methods, including a lab component with time spent in a New Haven high school. Prerequisites: Any course offered by Education Studies, or one course in history or any social science, either: Anthropology, Economics, Political Science, Psychology, Sociology. EDST 110 is preferred, although not required. SO

AFAM 1952a / PLSC 2363a / SOCY 2002a, Topics in Contemporary Social Theory Philip Gorski
In-depth introduction to recent developments in social theory, with particular emphasis on the last twenty years. Focus on three distinct areas of study: the building blocks and contrasting understandings of human persons and social action; the competing theories of the social structure of markets, institutions, cultures, social fields, and actor-networks; and the theoretical controversies concerning nations, states and empires, ethnic and racial identity, and the relation between facts and values in social research. Authors include Judith Butler, Michel Foucault, Jurgen Habermas, Pierre Bourdieu and Bruno Latour. SOCY 151 or equivalent is strongly recommended. WR, SO o Course cr

AFAM 1986a / LAST 1214a / PLSC 2417a / SOCY 1704a, Contesting Injustice Staff
Exploration of why, when, and how people organize collectively to challenge political, social, and economic injustice. Cross-national comparison of the extent, causes, and consequences of inequality. Analysis of mobilizations for social justice in both U.S. and international settings. Intended primarily for first years and sophomores. SO o Course cr

AFAM 2150a / ER&M 2534a / HIST 1131a / HSHM 2520a, History of Anti-Black Racism and Medicine Staff
The course traces how anti-Black racism shaped the development of western medicine in the Americas. It examines how ideas of anti-Blackness shaped the work of health practitioners and the experiences of patients. It engages the emergence of racial science and scientific racism, and how they contributed to the production of medical knowledge. More importantly, it centers the voices and experiences of Black people, and the various ways challenged racism through knowledge production and activism. It also addresses the enduring legacies of anti-Black racism in medical practice, and its impact on health inequality. HU o Course cr

* **AFAM 2310b / AMST 4445b, Politics and Culture of the U.S. Color Line** Matthew Jacobson and Lisa Lowe
The significance of race in U.S. political culture, from the "separate but equal" doctrine of Plessy v. Ferguson to the election of an African American president. Race as a central organizer of American political and social life. HU RP

* **AFAM 2317a / TDPS 2012a, Queer Caribbean Performance** Amanda Reid
With its lush and fantastic landscape, fabulous carnivalesque aesthetics, and rich African Diaspora Religious traditions, the Caribbean has long been a setting where New World black artists have staged competing visions of racial and sexual utopia and dystopia. However, these foreigner-authored fantasies have often overshadowed the lived experience and life storytelling of Caribbean subjects. This course explores the intersecting performance cultures, politics, and sensual/sexual practices that have constituted queer life in the Caribbean region and its diaspora. Placing Caribbean queer of color critique alongside key moments in twentieth and twenty-first century performance history at home and abroad, we ask how have histories of the plantation, discourses of race and nation, migration, and revolution led to the formation of regionally specific queer identifications. What about the idea of the "tropics" has made it such as fertile ground for queer performance making, and how have artists from the region identified or dis-identified with these aesthetic formations? This class begins with an exploration of theories of queer diaspora and queer of color critique's roots in black feminisms. We cover themes of exile, religious rites, and organizing as sights of queer political formation and creative community in the Caribbean. HU

* **AFAM 2339b / AMST 4461b / EDST 2209b / ER&M 1692b / WGSS 2202b, Identity, Diversity, and Policy in U.S. Education** Craig Canfield
Introduction to critical theory (feminism, queer theory, critical race theory, disability studies, trans studies, Indigenous studies) as a fundamental tool for understanding and critiquing identity, diversity, and policy in U.S. education. Exploration of identity politics and theory, as they figure in education policy. Methods for applying theory and interventions to interrogate issues in education. Application of theory and interventions to policy creation and reform. EDST 1110 recommended. WR, HU

* **AFAM 3145a / HIST 3145a, Enslavement in the Americas, 1500–1900** Edward Rugemer
This course explores the practice of enslavement in the Americas from the beginnings of colonization through the nineteenth century. The racialized slavery that emerged in the Americas was new to World History, developed by European colonists to exploit the natural resources of the Americas. Initially, European colonists enslaved indigenous peoples wherever possible, yet by the late sixteenth century the enslavement

of Africans had become far more common. We focus upon North American and the Caribbean, where European colonists developed sophisticated agricultural enterprises that produced for export to the European market and were completely dependent upon the enslaved labor of Africans. An enormous ocean commerce trafficked almost twelve million enslaved captives from the Atlantic coasts of Africa to work on the plantations of the Americas. The commerce in tobacco, sugar, rum, and cotton enabled these colonies to develop. Black people resisted enslavement at multiple levels, and throughout the Americas there emerged the Black cultures, languages, musics, struggles, and histories that we know and love today. WR, HU

* **AFAM 3170b / HIST 172Jb / HSHM 4630b, Care Work: Intersectional Pedagogical, Experiential, and Theoretical Approaches to Healing** Ayah Nuriddin

What does it mean to "care"? What models of care work do we need to attend to current crises? What models of care work can we learn from the past? Can we imagine a world where the concept of care, in its most inclusive, embracing, holistic, liberatory form operates as a fundamental value driving our global societies? These are some of the questions that inspired the creation of this course. In this seminar, students explore theoretical feminist, Black feminist, and Crip-of-Color perspectives of care work as well as experiential healing modalities that might interrupt cycles of harm often experienced by care workers. HU

* **AFAM 3615a / WGSS 3305a, Black Feminist Theory** Gail Lewis

This course is designed to introduce you to some of the major themes in black feminist theory. The course does so by presenting classic texts with more recent ones to give you a sense of the vibrancy of black feminist theory for addressing past and present concerns. Rather than interpret black feminist theory as a critical formation that simply puts race, gender, sexuality, and class into conversation with one another, the course apprehends that formation as one that produced epistemic shifts in how we understand politics, empire, history, the law, and literature. This is by no means an exhaustive list of the areas into which black feminism intervened. It is merely a sample of some of the most vibrant ideological and discursive contexts in which black feminism caused certain epistemic transformations. SO

* **AFAM 3675a / AMST 3355a / ER&M 3574a / FREN 3675a / LAST 2675a, Haiti Writes I** Marlene Daut and Kaiama Glover

From nineteenth-century antislavery pamphleteering to accounts of ecological catastrophe in 21st-century fiction, Haitian literature has resounded across the globe since the nation's revolutionaries declared independence in 1804. Starting with pre-revolutionary writing, including the emergence of Haitian Creole letters, moving through a long, largely francophone nineteenth century, to present-day Haitian writing in the English language, this two-semester exploration of Haitian literature presents the political, cultural, and historical frameworks necessary to comprehend Haiti's vast literary output. Whether writing in Haiti or its wide-ranging diasporas, Haitian authors have boldly contributed to pressing conversations in global letters while reflecting Haiti's unique cultural and historical experiences. Considering an expansive array of poets, playwrights, and novelists—such as Baron de Vastey, Juste Chanlatte, Demesvar Delorme, Edwidge Danticat, René Depestre, Kettly Mars, Dany Laferrière, and Évelyne Trouillot—this course engages students in a fresh examination of Haiti's richly polyglot and transnational literary tradition that spans more than two centuries.

* **AFAM 3713a / TDPS 3301a, Embodying Story** Renee Robinson
The intersection of storytelling and movement as seen through historical case studies, cross-disciplinary inquiry, and studio practice. Drawing on eclectic source materials from different artistic disciplines, ranging from the repertory of Alvin Ailey to journalism, architectural studies, cartoon animation, and creative processes, students develop the critical, creative, and technical skills through which to tell their own stories in movement. No prior dance experience necessary. Limited Enrollment. See Canvas for application. HU

AFAM 3860a / ENGL 3860a, Black Literature Staff
If we read it carefully, black literature tells a hidden history of the New World. This course introduces students to the key texts, authors, themes and traditions of African American literature. Reading major works by black writers, from the 18th century to the present, we will chart the historical conditions, social movements, and intellectual circuits that shaped this literature, as well as the innovative forms and aesthetics that characterize its signature style, depth, and dynamism. Engaging in the writing, reading, and archival practices of literary studies, we will explore black literatures as modes of expression, representation, critique, subversion, politics, fantasy, prophecy, and beyond. Authors include Frederick Douglass, Gwendolyn Brooks, Amiri Baraka, Toni Morrison, and more. WR, HU o Course cr

* **AFAM 3929a / SOCY 3742a, Managing Blackness in a "White Space"** Elijah Anderson
"White space" is a perceptual category that assumes a particular space to be predominantly white, one where black people are typically unexpected, marginalized when present, and made to feel unwelcome—a space that blacks perceive to be informally "off-limits" to people like them and where on occasion they encounter racialized disrespect and other forms of resistance. This course explores the challenge black people face when managing their lives in this white space. SO

* **AFAM 4134a / AFST 4834a / ENGL 4834a, Postcolonial World Literatures, 1945 to the Present** Stephanie Newell
Introduction to key debates about postwar world literatures in English, to the politics of English as a language of postcolonial literature, and to debates about globalization and culture. Themes include colonial history, postcolonial migration, translation, national identity, cosmopolitanism, and global literary prizes. WR, HU

* **AFAM 4357a / AFST 4457a / AMST 4470 / ER&M 4067a / FREN 481 / FREN 4810, Racial Republic: African Diasporic Literature and Culture in Postcolonial France** Fadila Habchi
This is an interdisciplinary seminar on French cultural history from the 1930s to the present. We focus on issues concerning race and gender in the context of colonialism, postcolonialism, and migration. The course investigates how the silencing of colonial history has been made possible culturally and ideologically, and how this silencing has in turn been central to the reorganizing of French culture and society from the period of decolonization to the present. We ask how racial regimes and spaces have been constructed in French colonial discourses and how these constructions have evolved in postcolonial France. We examine postcolonial African diasporic literary writings, films, and other cultural productions that have explored the complex relations between race, colonialism, historical silences, republican universalism, and color-blindness. Topics include the 1931 Colonial Exposition, Black Paris, decolonization, universalism, the

Trente Glorieuses, the Paris massacre of 1961, anti-racist movements, the "beur" author, memory, the 2005 riots, and contemporary afro-feminist and decolonial movements. HU

* **AFAM 4380a, Senior Colloquium: African American Studies** Sarah Mahurin
A seminar on issues and approaches in African American studies. The colloquium offers students practical help in refining their senior essay topics and developing research strategies. Students discuss assigned readings and share their research experiences and findings. During the term, students are expected to make substantial progress on their senior essays; they are required to submit a prospectus, an annotated bibliography, and a draft of one-quarter of the essay.

* **AFAM 4779a / MUSI 4480a, Music of the Caribbean: Cuba and Jamaica** Michael Veal
An examination of the Afro-diasporic music cultures of Cuba and Jamaica, placing the historical succession of musical genres and traditions into social, cultural, and political contexts. Cuban genres studied include religious/folkloric traditions (Lucumi/Santeria and Abakua), rumba, son, mambo, pachanga/charanga, salsa, timba and reggaeton. Jamaican genres studied include: folkloric traditions (etu/tambu/kumina), Jamaican R&B, ska, rock steady, reggae, ragga/dancehall. Prominent themes include: slavery, Afro-diasporic cultural traditions, Black Atlantic culture, nationalism/independence/post-colonial culture, relationships with the United States, music & gender/sexuality, technology. HU

African Studies (AFST)

AFST 203b / ENGL 2003b / LING 2030b, English in Post-Colonial Africa and the African Diaspora Staff
This course explores the importance of the English language in Post-colonial Africa. By examining the historical, socio-political, and cultural contexts that have influenced the evolution and adaptation of the English language, students will acquire insights into the linguistic diversity found in post-colonial Africa and its practical implications. The course explores the relationship between English and indigenous languages, focusing on their continuing influence in education, governance, literature, and identity formation. We also look at the linguistic structure of African American Vernacular English and explore possible connections to the languages of Africa and English-based creoles such as Gullah, spoken in the Caribbean and off the South Carolina coast. HU, SO

AFST 2170a / ER&M 2568a / LAST 1170a / PORT 2170a, A Luta Continua: African, Asian, and Indigenous Responses to Coloniality in the Lusophone World Kevin Ennis
What did it mean to be anticolonial in the era of revolution against the Portuguese Empire, and what does it mean today in the twenty-first century across the Portuguese-speaking world? In this course we examine the reverberations of anticolonial movements in Portuguese-speaking African and Asian territories, as well as in Indigenous movements in Brazil. Focusing on political, social, and cultural dimensions of emancipation, we ask: How have African, Asian, and Indigenous writers and artists imagined emancipatory endeavors for their peoples, their countries, and their worlds? What is the role of cultural expression in world-sharing and world-building in response

to centuries of colonialism and its legacies? This course also aims to further develop communicative proficiency in Portuguese and enhance knowledge of the diverse cultures of the Portuguese-speaking world. Prerequisite: PORT 140, or equivalent in placement. L5, HU

AFST 3340b / HIST 1340b, Africa in the Era of the Slave Trade Robert Harms
Examination of the tumultuous changes experienced by African societies during the era of the Atlantic slave trade, approximately 1450–1850. Focus on the complex interaction between the internal dynamics of African societies and the impact of outside forces. HU o Course cr

* **AFST 3344a / HIST 1344a, African Independence: A Cup of Plenty or a Poisoned Chalice?** Staff
In every African colony after World War Two there emerged nationalist movements which no longer called for civil rights as in the pre-war years but demanded self-determination. While many of them got it easy, some had to fight long and bloody wars for it. By the 1960s the colonial edifice had crumbled except for the few settler colonies in southern Africa. But even here the winds of change could not be stopped. But what did decolonization and independence mean to Africa? Did Africans get what they wanted? Was independence a cup of plenty or a poisoned chalice? In addressing these questions, this course charts the economic, political, and cultural transformations of postcolonial Africa from the 1960s to the present. The argument is this: there can be no understanding of Africa's challenges today without an inquiry into the nature of what the continent got from the departing colonial powers. HU o Course cr

* **AFST 3351a / CPLT 3351a / ENGL 2831a / FILM 3537a, The Nigerian 'Video Novel' and Nollywood** Staff
The course introduces students to an emerging genre of the Nigerian novel in which writers adopt narrative re-purposing strategies that invite transcription and adaptation to films. This evolving 'Nigerian visual novel', or 'video novel', is defined by its loosely structured, tabloid-themed and reader-friendly style, all reflecting the craft of Nollywood films, a thriving video film culture that emerged in the 1990s and has remained popular globally. Through the study of Nollywood films alongside new Nigerian fiction, the course will examine the techniques adopted by writers to accommodate the aesthetics of popular culture, to revive a declining readership, and to make literature more sellable. As these novels win literature prizes and find their way onto syllabi, the implications they have for our understanding of the African literary canon will be discussed. Students will view selected Nollywood movies and read a number of novels in the new genre in order to appraise the extent to which the serious and the sensuous intersect in this remaking of literariness. Seminar discussions will be accompanied by short lectures in which concepts such as 'trans-mediality', 'reverse-adaptation', 'screen-to-page', 'appropriation' and 'quotation' will be discussed to build an understanding of how the 'new' approach reconfigures Nigerian novels. HU

AFST 3381a / GLBL 2427a / PLSC 2427a, Government and Politics in Africa Staff
The establishment and use of political power in selected countries of tropical Africa. The political role of ethnic and class cleavages, military coups, and the relation between politics and economic development. SO o Course cr

* **AFST 3385a / EP&E 4350a / HIST 2391a / HIST 3344a / PLSC 3439a, Pandemics in Africa: From the Spanish Influenza to Covid-19** Jonny Steinberg
The overarching aim of the course is to understand the unfolding Covid-19 pandemic in Africa in the context of a century of pandemics, their political and administrative management, the responses of ordinary people, and the lasting changes they wrought. The first eight meetings examine some of the best social science-literature on 20th-century African pandemics before Covid-19. From the Spanish Influenza to cholera to AIDS, to the misdiagnosis of yaws as syphilis, and tuberculosis as hereditary, the social-science literature can be assembled to ask a host of vital questions in political theory: on the limits of coercion, on the connection between political power and scientific expertise, between pandemic disease and political legitimacy, and pervasively, across all modern African epidemics, between infection and the politics of race. The remaining four meetings look at Covid-19. We chronicle the evolving responses of policymakers, scholars, religious leaders, opposition figures, and, to the extent that we can, ordinary people. The idea is to assemble sufficient information to facilitate a real-time study of thinking and deciding in times of radical uncertainty and to examine, too, the consequences of decisions on the course of events. There are of course so many moving parts: health systems, international political economy, finance, policing, and more. We also bring guests into the classroom, among them frontline actors in the current pandemic as well as veterans of previous pandemics well placed to share provisional comparative thinking. This last dimension is especially emphasized: the current period, studied in the light of a century of epidemic disease, affording us the opportunity to see path dependencies and novelties, the old and the new. SO

* **AFST 4406a / GLBL 3363a / PLSC 3457a, Sexual Violence and War** Elisabeth Wood
Analysis of patterns of sexual violence in war. Assessment of how well scholars in various disciplines and policy analysts account for these patterns. SO

* **AFST 4435a / TDPS 3302a, West African Dance: Traditional to Contemporary** Lacina Coulibaly
A practical and theoretical study of the traditional dances of Africa, focusing on those of Burkina Faso and their contemporary manifestations. Emphasis on rhythm, kinesthetic form, and gestural expression. The fusion of modern European dance and traditional African dance. Admission by audition during the first class meeting. HU

* **AFST 4457a / AFAM 4357a / AMST 4470 / ER&M 4067a / FREN 481 / FREN 4810, Racial Republic: African Diasporic Literature and Culture in Postcolonial France** Fadila Habchi
This is an interdisciplinary seminar on French cultural history from the 1930s to the present. We focus on issues concerning race and gender in the context of colonialism, postcolonialism, and migration. The course investigates how the silencing of colonial history has been made possible culturally and ideologically, and how this silencing has in turn been central to the reorganizing of French culture and society from the period of decolonization to the present. We ask how racial regimes and spaces have been constructed in French colonial discourses and how these constructions have evolved in postcolonial France. We examine postcolonial African diasporic literary writings, films, and other cultural productions that have explored the complex relations between race, colonialism, historical silences, republican universalism, and color-blindness. Topics include the 1931 Colonial Exposition, Black Paris, decolonization, universalism, the Trente Glorieuses, the Paris massacre of 1961, anti-racist movements, the "beur" author,

memory, the 2005 riots, and contemporary afro-feminist and decolonial movements. HU

* **AFST 4491a, The Senior Essay** Veronica Waweru
Independent research on the senior essay. By the end of the sixth week of classes, a rough draft of the entire essay should be completed. By the end of the last week of classes (fall term) or three weeks before the end of classes (spring term), two copies of the final essay must be submitted.

* **AFST 4834a / AFAM 4134a / ENGL 4834a, Postcolonial World Literatures, 1945 to the Present** Stephanie Newell
Introduction to key debates about postwar world literatures in English, to the politics of English as a language of postcolonial literature, and to debates about globalization and culture. Themes include colonial history, postcolonial migration, translation, national identity, cosmopolitanism, and global literary prizes. WR, HU

Akkadian (AKKD)

AKKD 1100a, Elementary Akkadian I Eckart Frahm
Akkadian was one of the primary languages of ancient Mesopotamia (modern Iraq), with an attested history of more than 2000 years (from the second half of the 3rd millennium BCE to the beginning of the Common Era). It is a Semitic language, similar to Arabic, Aramaic, and Hebrew, written on clay tablets in the Cuneiform script. Hundreds of thousands of documents in Akkadian have come down to us. They include everything from great works of literature like the Gilgamesh Epic, to everyday texts such as letters that document the lives of people from all walks of life, from great kings to commoners and slaves. Whether it be a letter to a paranoid emperor who refuses to eat and shuts himself in his own palace, or a particularly inept spy reporting to his superiors about the suspicious dreams of a suspected enemy of the state, knowledge of Akkadian opens a window into the world of those who lived thousands of years ago, the struggles they faced and the stories they told. Akkadian for Beginners provides students with the tools to begin to explore that ancient and once-forgotten world of ancient Mesopotamia. After finishing the course, students will have acquired a sound knowledge of Akkadian grammar and syntax, along with practice in Cuneiform. L1

AKKD 1200b, Elementary Akkadian II Staff
Continuation of AKKD 1100. Prerequisite: AKKD 1100. L2

American Sign Language (ASL)

* **ASL 1100a, American Sign Language I** Staff
An introduction to American Sign Language (ASL) with the goal of building conversational competency in ASL by activating visual-spatial communication skills; mastering basic vocabulary, grammar and compositional structures; and developing awareness of the history of gestural languages and deaf people in society. L1 1½ Course cr

ASL 1120a, American Sign Language II Julia Silvestri
A continuation to American Sign Language (ASL) I, with emphasis on ASL grammar, expressive and receptive skills in storytelling and dialogues. Use of visual materials (DVD), grammar drills, proper use of non-manual markers and body language.

Emphasis on character development, role shifting and story cohesion. Prerequisite: ASL 110. L2 1½ Course cr

* **ASL 2130a, American Sign Language III** Staff
Building on ASL 120, the purpose of this course is to expand abstract conversational skills in American Sign Language by building on visual-spatial communication skills, vocabulary, grammar and compositional structures; while implementing a greater awareness of the history of gestural languages and deaf people in society through ASL community projects and literary production work. Prerequisites: ASL 120 or a placement evaluation by professor. L3 1½ Course cr

American Studies (AMST)

* **AMST 0029b / AMST 029 / ENGL 0729b / HUMS 0320b, Henry Thoreau** Michael Warner
Henry Thoreau played a critical role in the development of environmentalism, American prose, civil rights, and the politics of protest. We read his writing in depth, and with care, understanding it both in its historical context and in its relation to present concerns of democracy and climate change. We read his published writing and parts of the journal, as well as biographical and contextual material. The class makes a field trip to Walden Pond and Concord, learning about climate change at Walden as revealed by Thoreau's unparalleled documentation of his biotic surroundings. Student's consider Thoreau's place in current debates about the environment and politics, and are encouraged to make connection with those debates in a final paper. Previously ENGL 029. Enrollment limited to first-year students. HU

* **AMST 0031a / WGSS 0031a, LGBTQ Spaces and Places** Scott Herring
Overview of LGBTQ cultures and their relation to geography in literature, history, film, visual culture, and ethnography. Discussion topics include the historical emergence of urban communities; their tensions and intersections with rural locales; race, sexuality, gender, and suburbanization; and artistic visions of queer and trans places within the city and without. Emphasis is on the wide variety of U.S. metropolitan environments and regions, including New York City, Los Angeles, Miami, the Deep South, Appalachia, New England, and the Pacific Northwest. Enrollment limited to first-year students. HU

* **AMST 0039a / ENGL 0839a / ER&M 1539a, Latinx Literature Aside the Law** Joseph Miranda
How has Latinx identity emerged through and against the law? From the suspension of Puerto Rican sovereignty to the contemporary proliferation of ethnic studies bans, the state has used the law to delimit Latinx to transparent or static categories of irregular "citizen," "refugee," and "migrant." If conventional thinking assumes that art only responds to the law in protest or affirmation of the status quo, this seminar introduces students to the ways Latinx literature engages, resists, and disidentifies with the law as it delineates national belonging. We ask how do Latinx creative expressions expand the notions of citizenship, nation, and family beyond their raced, classed, and gendered origins to imagine new futures. Through attention to contemporary tv, film, novels, and poetry, we examine how Latinx artists build alternative forms of thriving collective life in forms of mutual aid, queer kinship, party, and protest. Works up for discussion include those by Justin Torres, Raquel Salas Rivera, and the television

show *Vida*. Drawing inspiration from these texts, students collaborate on podcasts, write analytical essays, and complete other critical and creative projects. Enrollment limited to first-year students. WR, HU

AMST 1109a / HIST 2140a / WGSS 1109a, US LGBTQ History & Queer Futures Staff
This interdisciplinary course offers a critical overview of queer history in the United States from the colonial era to the present, exploring the lives and experiences of LGBTQ individuals and emphasizing the broader historical evolution of ideas about sex, sexuality, and gender that constitute the ever-changing landscape of queer history. Through an intersectional lens, students analyze how gender, sexuality, race, and class have shaped LGBTQ identities, cultures, and political movements. Drawing heavily from primary sources including historical texts, literature, visual culture, and popular media, we investigate how queer lives and experiences have been represented, constructed, and contested across time. HU 0 Course cr

AMST 1110a / EDST 1110a / SOCY 1012a, Foundations in Education Studies Staff
Introduction to key issues and debates in the U.S. public education system with a focus on the nexus of education theory and research, policy and pedagogy. The course emphasizes social, scientific, economic, and political forces that shape approaches to schooling and education reform, and it includes theoretical and practical perspectives from practitioners, policymakers, and scholars. SO 0 Course cr

AMST 1115a / RLST 1150a, How to Build an American Religion Staff
This course offers an introduction to religion in the United States and theories from religious studies that argue its patterns. HU 0 Course cr

AMST 1120a / EVST 1120a / HIST 1120a / HSHM 2040a, American Environmental History Staff
Ways in which people have shaped and been shaped by the changing environments of North America from the nineteenth century to the present. Migration of species and trade in commodities; the impact of technology, agriculture, and industry; the development of resources in the American West and overseas; the conservation and environmental movements; planning and the impact of public policies; automobiles, highways, and urban growth; toxic chemicals, radiation, and environmental justice; climate change and energy transitions. WR, HU 0 Course cr

AMST 1142a / HIST 2149a, Early American Studies for 21st-Century America Staff
This introductory lecture offers students a scholarly initiation into the field of early American studies while also reflecting on the increasingly loud politicization of "early American history" as a scholarly and rhetorical project. From Hannah Nikole Jones' 1619 Project to the first Trump administration's 1776 Commission, from the "originalism" or some members of the United States judiciary to the neo-monarchism of so-called "dark enlightenment" thinkers (the Enlightenment itself also being an eighteenth-century movement, if a relatively small one), the politics of our present moment regularly invoke early American history to ground and legitimate their ethical, political, historical, and visionary claims. While this course is primarily an introduction to early American studies—an interdisciplinary approach to the study of the period that draws on scholarship in history, literature, and law, among other fields— the course is organized into three sections, organized around three themes (sovereignty, labor, and governance), and at the end of each section we engage twenty-

first century political debates surrounding these themes. This course focuses on British colonial North America, and then the early national United States before 1865, but readings cluster around the long eighteenth century. Topics may include the histories, geographies and politics of Native nations prior to the incursion of Europeans into the region; the labor cultures of bondage (chattel slavery) and indenture; anti-government, anti-monarchical and revolutionary movements; the legal architecture of Native dispossession; the beginnings of nationalist imperialism; the politics of democratic governance; regional, religion-based, and culturally-specific formations of gendered and sexual comportment; visual and/or literary arts of the era; abolitionist movements (temperance, anti-slavery); the creation of citizenship infrastructures as well as those controlling immigration and naturalization; and contemporary visions of what "Americanness" meant, looked like, or represented. HU o Course cr

*** AMST 1184a / ENGL 2464a / HUMS 1840a, Approaches to Contemporary Biography: Writing and Reading Biography** Karin Roffman

The art of biography explored through groundbreaking examples, with particular emphasis on contemporary texts that explore the lives and work of artists. Topics on biographical theory and practice include: the balance of life and work; the relationship between biographer and subject; creative approaches to archives and research; and imaginative narrative strategies. Some classes take place at the Beinecke Library and there are some visits by working biographers. Students must complete an original biographical project by the end of the semester. HU RP

AMST 1197a / ARCH 2600a / HIST 1125a / HSAR 3219a / URBN 1101a, American Architecture and Urbanism Staff

Introduction to the study of buildings, architects, architectural styles, and urban landscapes, viewed in their economic, political, social, and cultural contexts, from precolonial times to the present. Topics include: public and private investment in the built environment; the history of housing in America; the organization of architectural practice; race, gender, ethnicity and the right to the city; the social and political nature of city building; and the transnational nature of American architecture. HU o Course cr

*** AMST 2233a / ER&M 3536a / HIST 2196a / WGSS 2235a, Another "Other" — Introducing Critical Theories and Histories of Disability** Jiya Pandya

What is disability? How has its definition changed over time? How do people "become" disabled and how does one inhabit a disabled body? In what ways has the disabled body become a site for enacting imperial, national, and resistant politics? Where and how are alternate, radical visions of health being developed? This introductory course in Disability Studies poses answers to these and other related questions through an overview of key texts and debates in the growing field of disability studies. Students will learn about the transnational history of disability and disability rights, think about the intersections of disability, race, sexuality, gender, and citizenship, and engage with questions of accessibility and activism that already exist in spaces around you. This course, composed of three modules on "disability," "disidentifications" with disability, and "disability justice" and "health liberation," is meant to be both an academic overview of a field and a toolkit for advocacy. As we reckon with the longer impacts of COVID-19 and process what it means to live life during and after a global pandemic, it makes most sense for us to turn to those who have reckoned with what it means to live in "crisis," to inhabit a body

that is almost-always at "risk," and to build creative forms of care and community. We will spend significant time with disabled writers, artists, and scholars who offer insight and memory about interactions with and between medicine, war, design, technology, sexuality, race, and imperialism. none

* **AMST 2246a / ENGL 2826a / PLSC 2846a, The Media and Democracy** Joanne Lipman

In an era of "fake news," when the media is under attack, misinformation is at epidemic levels, and new technologies are transforming the way we consume news, how do journalists hold power to account? What is the media's role in promoting and protecting democracy? Students explore topics including objectivity versus advocacy, and hate speech versus First Amendment speech protections. Case studies span from 19th century Yellow Journalism to the #MeToo and #BlackLivesMatter movements, to the rise of AI journalism and social media "news influencers." SO

* **AMST 2255b / CPSC 2155b, Artificial Intelligence, Ethics, and Society** Julian Posada

This seminar examines the development and implementation of artificial intelligence technologies across a broad array of social contexts, incorporating historical, cultural, economic, legal, and political perspectives. The course provides an in-depth study of contemporary AI, from its historical development and varied definitions to current issues, emphasizing the relationship between power dynamics and ethical considerations. After establishing a foundation in theories and the study of ethics and power, the course delves into diverse aspects of AI, including the implications of human labor and material infrastructures in the development of the technology, concerns related to bias and discrimination, and its impacts on the environment. The concluding module applies these discussions to real-world scenarios, exploring how to address ethical and societal issues through legal and human rights frameworks, governance and regulation, and grassroots initiatives. This course is ideal for both computer science and engineering students seeking a socio-humanistic perspective on artificial intelligence, and humanities and social sciences students interested in the societal implications of AI. HU, SO

* **AMST 2262a / ER&M 3000a, Comparative Ethnic Studies** Ximena Lopez Carrillo

Introduction to the methods and practice of comparative ethnic studies. Examination of racial formation in the United States within a transnational framework. Legacies of colonialism, slavery, and racial exclusion; racial formation in schools, prisons, and citizenship law; cultural politics of music and performance; social movements; and postcolonial critique. SO

* **AMST 2265a / CPSC 2265a, Topics in Critical Computing** Julian Posada and Theodore Kim

This course introduces the social, cultural, and political contexts shaping the contemporary development and use of computing and information technology. Through structured discussions, lectures, and collaborative activities, participants will explore computing's historical evolution, ethical and societal implications, and tangible impacts, including its reliance on transnational infrastructures and environmental effects. Emphasis will be placed on analyzing computer-related social issues through theoretical and critical approaches, empirical research, and governance frameworks, as well as both technical and social strategies for addressing key challenges. The course is designed for students from diverse academic backgrounds across all divisions, aiming to develop a nuanced understanding of computation's intersection with broader social

systems and to equip them with tools to engage with critical issues in the rapidly shifting digital landscape. HU, SC

AMST 2272a / ER&M 2682a / HIST 11183a / WGSS 2272a, Asian American History, 1800 to the Present Staff

An introduction to the history of East, South, and Southeast Asian migrations and settlement to the United States from the late eighteenth century to the present. Major themes include labor migration, community formation, U.S. imperialism, legal exclusion, racial segregation, gender and sexuality, cultural representations, and political resistance. HU 0 Course cr

* **AMST 3300a / WGSS 3350a, The Invention of Love** Igor De Souza

This course proposes a historical, theoretical, and cultural investigation of what we call "romantic love," the kind of love we tend to associate with courtship, with relationships that include a sexual-erotic component, and with marriage. We begin with Denis de Rougemont's controversial thesis that romantic love was invented around the 1200s in the courtly culture of Southern France. We examine manifestations of romantic love in medieval Arab cultures as precedents to the invention of courtly love. In the second part of our course, we turn to modern humanistic theories about romantic love. Among the questions that critical theorists and philosophers have posed, we consider: How is love related to desire? Is sexual desire an indispensable component of romantic love? Is romantic love ultimately a selfish, exclusionary act, or is it about renouncing the self, losing the self in the other? In the third part of our course, we apply the insights of parts 1 and 2 to discuss case studies of romantic love in the contemporary United States. In this section, we explore reining assumptions between romantic love and: marriage; monogamy; dating; the digital environment; queerness; age; and transnationalism.

* **AMST 3302a / ER&M 3012a / HSHM 4930a / WGSS 3312a, Technology, Race and Gender** Kalindi Vora

In this course, we discuss technology and the politics of difference through a survey of topics including artificial intelligence, digital labor (crowdsourcing), and robotics and computer science. Materials for study include humanistic and social scientific critique, ethnographies of technology, technical writing and scientific papers, as well as speculative art practices including design, visual art and fiction. What assumptions and politics of imagination govern the design and development of new technologies? What alternative imaginaries, politics, or even speculations, can be identified with a feminist analytic lens? The seminar also includes a practicum component where we practice the politics of speculation through writing and design projects. To do this we study everything from active STEM projects at Yale to speculative fiction and film to think about how structures of race, gender, sexuality, ability, nation, and religious difference inform how we "speculate" or imagine the future through the ways we design and build technological worlds in practice and in fiction. HU, SO

* **AMST 3303a / EP&E 247 / ER&M 3530a / FILM 2980a / SAST 2620a, Digital War** Madiha Tahir

From drones and autonomous robots to algorithmic warfare, virtual war gaming, and data mining, digital war has become a key pressing issue of our times and an emerging field of study. This course provides a critical overview of digital war, understood as the relationship between war and digital technologies. Modern warfare has been shaped by digital technologies, but the latter have also been conditioned through modern conflict: DARPA (the research arm of the US Department of Defense), for instance, has

innovated aspects of everything from GPS, to stealth technology, personal computing, and the Internet. Shifting beyond a sole focus on technology and its makers, this class situates the historical antecedents and present of digital war within colonialism and imperialism. We will investigate the entanglements between technology, empire, and war, and examine how digital war—also sometimes understood as virtual or remote war—has both shaped the lives of the targeted and been conditioned by imperial ventures. We will consider visual media, fiction, art, and other works alongside scholarly texts to develop a multidiscpinary perspective on the past, present, and future of digital war.
none HU, SO

* **AMST 3304a / ANTH 3304a / ER&M 3304a / HUMS 3304a / SOCY 3104a, Ethnography & Journalism** Madiha Tahir
While each is loathed to admit it, journalism and ethnography are cousins in some respects interested in (albeit distinct) modes of storytelling, translation, and interpretation. This methods course considers these shared grounds to launch a cross-comparative examination. What can the practies of each field and method—journalism and ethnography—tell us about the other? How do journalists and ethnographers engage ideas about the truth? What can they learn from each other? Students spend the first four weeks studying journalistic methods and debates before shifting to ethnographic discussions, and finally, comparative approaches to writing; data and evidence; experience and positionality. HU, SO

* **AMST 3321a / TDPS 2003a, Introduction to Dramaturgy** Tav Nyong'o
This course explores the evolution of dramaturgy from its German modern origins to its contemporary role in performance studies and social practice. Students will examine how theories of performativity have expanded our understanding of dramatic structure beyond traditional theatrical contexts. The course investigates how social movements, cultural rituals, and everyday interactions can be analyzed through dramaturgical frameworks, while broadening the definition of "texts" that can be adapted for performance. Through both theoretical study and practical application, students will develop core dramaturgical skills by analyzing diverse performance texts for structure, meaning, and cultural context. Course projects include collaborating on a literary adaptation with a director and participating in a devised work with a contemporary artist, emphasizing the dramaturg's role as a cultural interpreter, creative collaborator, and social critic in today's performance landscape. Please email the instructor describing your relevant background and reason for interest in the class.
WR, HU

* **AMST 3325a / ER&M 3556a / WGSS 1135a, Latina.x.e Feminist Archives** Deb Vargas
The course introduces students to Latina/x/e feminist archives. We focus on historical and contemporary writings by and about Chicana, Puerto Rican, Central American, and other Latina/x/e feminist writers and activists. The course draws from interdisciplinary scholarship addressing the intellectual landscape of Latina/x/e and critical race feminist theories and social movement activist organizing. While this course approaches Latina/x/e feminist theories and activism as often having emerged in relation to U.S. nation-making projects we will consider this work with the understanding that projects of Latina/x/e feminism should be understood as cross-border, transnational, and multi-scaler critiques of nation-state violence. HU

* **AMST 3333a / ENGL 3811a, American Strangeness** Sarah Mahurin and Aaron Magloire
This course examines various elements of strangeness—he uncanny, the macabre, the absurd, the shocking—as seen in and through modern and contemporary American literature. How do authors depict, and how do readers contend with, bizarre phenomena? What is the role of readerly expectation (met and unmet)? How do concepts of "form" and "genre" react to and against competing concepts of strangeness? We will examine convention and its breaking, mysticism and supernaturality, and our changing sense of what counts as weird. HU

* **AMST 3334a / CPLT 3500a / FILM 3540a / GMAN 3460a / HUMS 3466a, Uwe Johnson's Anniversaries: From A Year in the Life of Gesine Cresspahl** Austen Hinkley
Uwe Johnson's *Anniversaries: From A Year in the Life of Gesine Cresspahl* remains a monument of postwar German literature—and it was written in and about New York City. Across its 367 short chapters (each corresponding to a day of the year), the novel unfolds on three levels: the historical present in New York, memories and family history from Germany, and reporting from the New York Times on current events. The result is a view of life, politics, and history in the middle of the 20th century that is as rich and expansive as it is fragmented. The social and political climate of New York in the late '60s is put into contact with memories of the rise of Nazism in Germany; reporting on the Vietnam war, the civil rights movement and the Prague Spring is refracted through the lenses of the protagonist's past life in East Germany and her new life raising her daughter alone in New York. This course undertakes a close reading of Johnson's sprawling novel with attention to its many historical, political, and literary contexts. Readings from the novel are complemented by relevant short readings on theories of media, politics, literature, and history. No prior knowledge of German language and literature is required.
HU

* **AMST 3336b / WGSS 3335b, LGBTQ Life Spans** Scott Herring
Interdisciplinary survey of LGBTQ life spans in the United States concentrating primarily on later life. Special attention paid to topics such as disability, aging, and ageism; queer and trans creative aging; longevity and life expectancy during the AIDS epidemic; intergenerational intimacy; age and activism; critiques of optimal aging; and the development of LGBTQ senior centers and affordable senior housing. We explore these topics across multiple contemporary genres: documentary film (*The Joneses*), graphic memoir (Alison Bechdel's *Fun Home*), poetry (Essex Hemphill's "Vital Signs"), fabulation (Saidiya Hartman's *Wayward Lives, Beautiful Experiments*), and oral history. We also review archival documents of later LGBTQ lives—ordinary and iconic—held at the Beinecke Rare Book and Manuscript Library as well as the Lesbian Herstory Archives. HU

* **AMST 3339a / ER&M 4050a, Bad Bunny: Musical Aesthetics and Politics** Albert Laguna
This course examines the music of Bad Bunny as a point of departure for developing our skills as close listeners attentive to how cultural production creates interpretive avenues for understanding how aesthetics, history, and politics intersect. Topics include the history of Puerto Rico and its colonial past and present (tourism, debt crisis, hurricanes); the evolution of musical forms (bomba, plena, salsa, reggaeton) and their

travels across the Americas; and the Puerto Rican diaspora in New York City.
none HU

* **AMST 3355a / AFAM 3675a / ER&M 3574a / FREN 3675a / LAST 2675a, Haiti Writes I** Marlene Daut and Kaiama Glover
From nineteenth-century antislavery pamphleteering to accounts of ecological catastrophe in 21st-century fiction, Haitian literature has resounded across the globe since the nation's revolutionaries declared independence in 1804. Starting with pre-revolutionary writing, including the emergence of Haitian Creole letters, moving through a long, largely francophone nineteenth century, to present-day Haitian writing in the English language, this two-semester exploration of Haitian literature presents the political, cultural, and historical frameworks necessary to comprehend Haiti's vast literary output. Whether writing in Haiti or its wide-ranging diasporas, Haitian authors have boldly contributed to pressing conversations in global letters while reflecting Haiti's unique cultural and historical experiences. Considering an expansive array of poets, playwrights, and novelists—such as Baron de Vastey, Juste Chanlatte, Demesvar Delorme, Edwidge Danticat, René Depestre, Kettly Mars, Dany Laferrière, and Évelyne Trouillot—this course engages students in a fresh examination of Haiti's richly polyglot and transnational literary tradition that spans more than two centuries.

* **AMST 3361a / ER&M 3561a, Comparative Colonialisms** Lisa Lowe
Settler colonialism, slavery, racialized immigration, and imperial war have been integral to the emergence of the U.S. nation, state, and economy, and the consequences of these histories continue today. In this interdisciplinary undergraduate seminar, we examine the relevance of these historical and ongoing formations to the founding and development of the United States, giving attention to the independence of each, as well as to their differences, convergences, and contestations. We consider the strengths and limits of different analytic frames for understanding these histories of colonialism, enslavement, capitalism, and empire. We approach the study through readings in history, anthropology, political economy, literature, arts, and other materials. HU

* **AMST 3365a / EP&E 4399a / ER&M 3695a / FILM 2680, Platforms and Cultural Production** Julian Posada
Platforms—digital infrastructures that serve as intermediaries between end-users and complementors—have emerged in various cultural and economic settings, from social media (Instagram), and video streaming (YouTube), to digital labor (Uber), and e-commerce (Amazon). This seminar provides a multidisciplinary lens to study platforms as hybrids of firms and multi-sided markets with unique history, governance, and infrastructures. The thematic sessions of this course discuss how platforms have transformed cultural production and connectivity, labor, creativity, and democracy by focusing on comparative cases from the United States and abroad. The seminar provides a space for broader discussions on contemporary capitalism and cultural production around topics such as inequality, surveillance, decentralization, and ethics. Students are encouraged to bring examples and case studies from their personal experiences. HU, SO

* **AMST 3399b, Histories and Methods of American Studies** Laura Barraclough
Intended primarily for juniors in American Studies, this course serves as both an introduction to American Studies and preparation for senior essays/projects in the major. It explores the histories of American Studies as a field and examines commonly used research methods. Students chart their own entry points and pathways through

American Studies by completing scaffolded assignments that draw on both primary and secondary sources. Secondary objectives include strengthening relationships with American Studies faculty and peers and deepening engagement with the undergraduate American Studies program at Yale. Juniors in the American Studies major. Other students may be admitted with instructor permission. HU

* **AMST 3831a / ENGL 3831a / ER&M 3831a / WGSS 3831a, Texxture** Sunny Xiang
The term *texxture* was first used by queer studies scholars to describe a density of tactile information about an object's provenance, composition, circulation, and use. This brilliant coinage offers an immanent theorization of texture as something like an x-factor—an excess and an essence, something magical yet practical, a strange intensity and the thing itself. Such ambiguities, however, also contribute to texture's interpretive difficulties. For whether we have in mind a velvet armchair, a pair of distressed jeans, a handbound book, or a tablet computer, texture performs a dramatic revelation to the extent that it is also shadowed by deception and ambivalence. These paradoxes and cruxes inspire a range of inquiries for our class: What can the perception and creation of texture teach us about the sensorial and material politics of race, gender, empire, capitalism, and art? How might texture help us study the relation between desire and violence, especially at the interface of touch? What things, beings, events, places, emotions, and ideas appear to have a texture? What is texture's route to intelligibility, and is there a scale or unit at which texture vanishes? WR, HU

* **AMST 4407b / ER&M 3691b / HSHM 4550b, Eugenics and its Afterlives** Daniel HoSang
This course examines the influence of Eugenics research, logics, and ideas across nearly every academic discipline in the 20th century, and the particular masks, tropes, and concepts that have been used to occlude attentions to these legacies today. Students make special use of the large collection of archives held within Yale Special Collections of key figures in the American Eugenics Society. Students work collaboratively to identify alternative research practices and approaches deployed in scholarly and creative works that make racial power visible and enable the production of knowledge unburdened by the legacies of Eugenics and racial science. HU o Course cr

* **AMST 4409b / HIST 3166b / WGSS 4409b, Asian American Women and Gender, 1830 to the Present** Mary Lui
Asian American women as key historical actors. Gender analysis is used to reexamine themes in Asian American history: immigration, labor, community, cultural representations, political organizing, sexuality, and marriage and family life. WR, HU

* **AMST 4441a / ER&M 3570a / HIST 3130a, Indians and the Spanish Borderlands** Ned Blackhawk
The experiences of Native Americans during centuries of relations with North America's first imperial power, Spain. The history and long-term legacies of Spanish colonialism from Florida to California. WR, HU

* **AMST 4445b / AFAM 2310b, Politics and Culture of the U.S. Color Line** Matthew Jacobson and Lisa Lowe
The significance of race in U.S. political culture, from the "separate but equal" doctrine of Plessy v. Ferguson to the election of an African American president. Race as a central organizer of American political and social life. HU RP

* **AMST 4447b / EDST 2270b / ER&M 3567b, Contemporary Native American K-12 and Postsecondary Educational Policy** Matthew Makomenaw
This course explores Native American educational policy issues, programming, funding, and success. Native American representation in policy conversations is often incomplete, complicated, or relegated to an asterisk resulting in a lack of resources, awareness, and visibility in educational policy. This course examines the challenges and issues related to Native education; however, the impetus of this course centers on the resiliency, strength, and imagination of Native American students and communities to redefine and achieve success in a complex and often unfamiliar educational environment. EDST 1110 recommended. SO

* **AMST 4449a / FILM 4470a / HIST 2114a, The Historical Documentary** Charles Musser
This course looks at the historical documentary as a method for carrying out historical work in the public humanities. It investigates the evolving discourse sand resonances within such topics as the Vietnam War, the Holocaust and African American history. It is concerned with their relationship of documentary to traditional scholarly written histories as well as the history of the genre and what is often called the "archival turn."

* **AMST 4453b / HIST 3119b, The United States Constitution of 1787** Mark Peterson
This undergraduate seminar is organized around developing a deep historical understanding of one of our most important documents, the United States Constitution, as it emerged in the late 1780s. In addition to close reading and analysis of this fundamental text, we read a series of other primary sources relevant to the evolution of constitutional thought and practice in the Anglo-American tradition of the early modern period. And we engage relevant secondary scholarship produced by professional historians over the past century or more, in an effort to grapple with the evolution of changing approaches to the Constitution and its meaning over time. This course carries PI credit in History. WR, HU

* **AMST 4459b / ANTH 465 / ANTH 4865b, Multispecies Worlds** Kathryn Dudley
This seminar explores the relational and material worlds that humans create in concert with other-than-human species. Through an interdisciplinary analysis of the problematic subject of anthropology—Anthropos—we seek to pose new questions about the fate of life worlds in the present epoch of anthropogenic climate change. Our readings track circuits of knowledge from anthropology and philosophy to geological history, literary criticism, and environmental studies as we come to terms with the loss of biodiversity, impending wildlife extinctions, and political-economic havoc wrought by global warming associated with the Anthropocene. A persistent provocation guides our inquiry: What multispecies worldings become possible to recognize and cultivate when we dare to decenter the human in our politics, passions, and aspirations for life on a shared planet? SO

* **AMST 4461b / AFAM 2339b / EDST 2209b / ER&M 1692b / WGSS 2202b, Identity, Diversity, and Policy in U.S. Education** Craig Canfield
Introduction to critical theory (feminism, queer theory, critical race theory, disability studies, trans studies, Indigenous studies) as a fundamental tool for understanding and critiquing identity, diversity, and policy in U.S. education. Exploration of identity politics and theory, as they figure in education policy. Methods for applying theory and

interventions to interrogate issues in education. Application of theory and interventions to policy creation and reform. EDST 1110 recommended. WR, HU

* **AMST 4463a / EVST 4630a / FILM 4550a / TDPS 4023a, Documentary Film Workshop** Charles Musser
A yearlong workshop designed primarily for majors in Film and Media Studies or American Studies who are making documentaries as senior projects. Seniors in other majors admitted as space permits. RP

* **AMST 4469a / EP&E 4396a / PLSC 3238a, American Progressivism and Its Critics** Stephen Skowronek
The progressive reform tradition in American politics. The tradition's conceptual underpinnings, social supports, practical manifestations in policy and in new governmental arrangements, and conservative critics. Emphasis on the origins of progressivism in the early decades of the twentieth century, with attention to latter-day manifestations and to changes in the progressive impulse over time. SO

* **AMST 4471a and AMST 4472b, Individual Reading and Research for Juniors and Seniors** Laura Wexler
Special projects intended to enable the student to cover material not otherwise offered by the program. The course may be used for research or for directed reading, but in either case a term paper or its equivalent is required as evidence of work done. It is expected that the student will meet regularly with the faculty adviser. To apply for admission, a student should submit a prospectus signed by the faculty adviser to the director of undergraduate studies.

* **AMST 4481a / ENGL 4811a / ER&M 3511a, The Native American Novel** Lloyd Kevin Sy
This course explores the evolution of the Native American novel, tracing its development from *The Life and Adventures of Joaquín Murieta* (1854) to contemporary works. We will examine how Indigenous writers have used the novel to engage with themes such as sovereignty, memory, land, identity, assimilation, and storytelling as resistance. Readings may include works by John Rollin Ridge, Zitkála-Šá, D'Arcy McNickle, N. Scott Momaday, Leslie Marmon Silko, Louise Erdrich, Gerald Vizenor, and Tommy Orange. Through close reading and critical analysis, we will consider how Native novelists navigate history, genre, and literary form to challenge dominant narratives. None WR, HU

* **AMST 4491a or b, Senior Project** Laura Wexler
Independent research and proseminar on a one-term senior project. For requirements see under "Senior requirement" in the American Studies program description.

* **AMST 4493a and AMST 4494b, Senior Project for the Intensive Major** Staff
Independent research and proseminar on a two-term senior project. For requirements see under "Senior requirement" in the American Studies program description.

Ancient Greek (GREK)

GREK 1001a, Beginning Greek: The Elements of Greek Grammar Staff
Introduction to ancient Greek. Emphasis on morphology and syntax within a structured program of readings and exercises. Prepares for GREK 1002. No prior knowledge of Greek assumed. L1 1½ Course cr

GREK 1002b, Beginning Greek: Review of Grammar and Selected Readings Staff
Continuation of GREK 1001. Emphasis on consolidating grammar and on readings from Greek authors. The sequence GREK 1001 and 1002 prepares for 2003 and/or 2004. Prerequisite: GREK 1001 or equivalent. L2 1½ Course cr

* **GREK 1012b, Intensive Beginning Greek** Timothy Robinson
An introduction to classical Greek for students with no prior knowledge of the language. Readings from Greek authors supplement intensive instruction in grammar and vocabulary. The course is intended to be of use to students with diverse academic backgrounds and interests. Prepares for GREK 131. Not open to students who have taken GREK 110, 120. L1, L2 RP 2 Course cr

GREK 2003a, Greek Prose: An Introduction Staff
Close reading of selections from classical Greek prose with review of grammar. Counts as L4 if taken after GREK 2004 or equivalent. L3

GREK 2004b, Homer: An Introduction Staff
A first approach to reading Homeric poetry in Greek. Selected books of the *Iliad* or the *Odyssey.* Counts as L4 if taken after GREK 2003 or equivalent. L3

* **GREK 3335a, The Poetry of Illness** Malina Buturovic
Following the red thread of plague, healing, and disease, this course offers an introductory overview to major authors and genres of Classical Greek literature. We begin in the Archaic period with selections of Homer, then jump forward to Sophocles, Euripides, and Thucydides. Reading across these texts, we ask: how did the Greeks think about the causes of diseases? How did they diagnose illness? How did they divide responsibility for illness between gods, doctors, and patients? What role did plague and healing occupy in civic life? Alongside this thematic study, the course also offers a structured review of Greek morphology and syntax. This course is a bridge course, which is designed to transition students from L4 to L5 and which bestows L5 credit upon completion. This course is designed for students who are proficient in Greek, having had at least 3–4 years of high school Greek or a minimum of two full years of Greek at the college level (having completed L4). L5

* **GREK 4025a, Homer's *Iliad*** Egbert Bakker
Reading of selected books of the *Iliad,* with attention to Homeric language and style, the Homeric view of heroes and gods, and the reception of Homer in antiquity. L5, HU

GREK 5025a, Homer's *Iliad* Egbert Bakker
Reading of selected books of the *Iliad,* with attention to Homeric language and style, the Homeric view of heroes and gods, and the reception of Homer in antiquity.

Anthropology (ANTH)

* **ANTH 0418a, Scientific Thinking and Reasoning** Eduardo Fernandez-Duque
Students read, discuss and reflect on the paramount importance of science and quantitative reasoning in their lives through an exploration of the basic elements of a quantitative scientific process of inquiry. The goal of the course is to introduce students to foundational topics in science that must be, but sometimes are not, thoroughly considered early in the process of scientific inquiry. The first part focuses on reading about truth, facts and skepticism, causality, inference, deductive and inductive reasoning, research questions, and formulation of hypotheses and predictions. The

second part considers aspects related to the actual development and implementation of a scientific study including considerations of types of study (e.g, observational, experimental), study feasibility, sample size, selection and validity of variables, power analysis, confounding factors. The third part considers the analyses, interpretation and presentation of results, offering introductory explanations of *a priori* statistical protocols; predictive and/or explanatory power and interpretation of both statistical significance and research relevance. The course is neither a lecture or seminar, but instead each meeting is a hybrid of both formats; a format where students are required to be active participants in the process of learning. Enrollment limited to first-year students. SC, SO

* **ANTH 0661a, Understanding Human Origins** Jessica Thompson
This course deals with scientific questions of what we know about human origins and human evolution. It presents evidence from evolutionary and life history theory, geochronology, paleontology, paleoenvironmental reconstruction, phylogenetic analysis, genetics, archaeology, and functional morphology. It also tackles the issue of how we know what we think we know of our own ancestry over the past 6 million years. In other words, what constitutes evidence for human evolution and how is that evidence interpreted? Students are introduced to basic milestones in human evolution and learn how they have shaped us into the species we are today, using diverse lines of evidence from evolutionary and life history theory, geochronology, paleontology, paleoenvironmental reconstruction, phylogenetic analysis, genetics, archaeology, and functional morphology. We critically examine key debates that have taken place over the last century of exploration in human evolutionary research, learning how unconventional thinking and spectacular discoveries have shaped current knowledge of our origins. Students meet strange and fascinating historical characters, and then meet our fossil ancestors via the cast collection. Students also receive hands-on and interactive learning about the morphology, life history patterns, locomotion, social behavior, and diet of our nearest fossil relatives; observe living primates to assess what they can tell us about our own deep past; dive into data collection by locating real archaeological and fossil sites; and learn how molecular techniques such as ancient DNA have transformed understanding of the origins of our own species. By formally debating controversial issues with classmates, students learn what a surprising amount of information scientists can discern from fragmentary fossils, and are brought up to date with the most current discoveries in human evolution. Enrollment limited to first-year students. SO

* **ANTH 0811b, Reproductive Technologies** Marcia Inhorn
Introduction to scholarship on the anthropology of reproduction. Focus on reproductive technologies such as contraceptives, prenatal diagnostics, childbirth technologies, abortion, assisted reproduction, surrogacy, and embryonic stem cells. The globalization of reproductive technologies, including social, cultural, legal, and ethical responses. Enrollment limited to first-year students. SO

ANTH 1172b / ARCG 1172b, Great Hoaxes and Fantasies in Archaeology William Honeychurch
Examination of selected archaeological hoaxes, cult theories, and fantasies; demonstration of how archaeology can be manipulated to authenticate nationalistic ideologies, religious causes, and modern stereotypes. Examples of hoaxes and fantasies include the lost continent of Atlantis, Piltdown man, ancient giants roaming the earth,

and alien encounters. Evaluation of how, as a social science, archaeology is capable of rejecting such interpretations about the past. SO

ANTH 1200b / HUMS 1210b / NELC 1200b, Unequal: Dynamics of Power and Social Hierarchy in Ancient Egypt and Mesopotamia Gojko Barjamovic
The course "Unequal" examines the historical roots of intolerance, slavery, and imperialism, emphasizing how our perceptions of history shape contemporary beliefs and policies. It challenges the notion that inequality is an inevitable outcome of societal complexity, positing that historical narratives often frame progress and freedom while obscuring themes of inequality. By investigating early human history, the course aims to unpack the concepts of identity, possession, value, freedom, and power, exploring their impact on modern society. Rather than focusing on specific literature or chronological period, "Unequal" centers around critical questions about human culture. The course employs innovative experimental lab assignments, allowing students to engage with the past creatively, such as cooking ancient recipes, brewing beer, and creating virtual museum exhibits. This interdisciplinary approach encourages a deeper understanding of the historical context that informs present-day issues, inviting students to rethink common narratives and assumptions about equality and progress. Ultimately, the course aims to foster critical thinking about the interplay between history and contemporary society. HU, SO o Course cr

ANTH 1400a, Introduction to Biological Anthropology Staff
Introduction to human and primate evolution, primate behavior, and human biology. Topics include a review of principles of evolutionary biology and basic molecular and population genetics; the behavior, ecology, and evolution of nonhuman primates; the fossil and archaeological record for human evolution; the origin of modern humans; biological variation in living humans; and the evolution of human behavior. SC, SO o Course cr

ANTH 1482a, Primate Behavior and Ecology Staff
Survey of the ecological and behavioral diversity among nonhuman primates (lemurs, lorises, monkeys, and apes). Introduces students to the study of behavioral evolution and to variation in primate habitats and ecological adaptations, mating systems, and social behavior. Among the topics are links between ecology and social organization; cooperation and competition; the complexities of social life and adaptive benefits of sociality; and case studies such as baboons, gorillas, and chimpanzees. Relevance of studying nonhuman primates to understanding human behavior is a major theme. SO o Course cr

ANTH 1700a, An Introduction to Cultural Anthropology Staff
Anthropological study of cosmology, tacit knowledge, and ways of knowing the world in specific social settings. Ways in which sociocultural specificity helps to explain human solutions to problems of cooperation and conflict, production and reproduction, expression, and belief. Introduction to anthropological ways of understanding cultural difference in approaches to sickness and healing, gender and sexuality, economics, religion, and communication. SO o Course cr

ANTH 1840b / ER&M 2541b / SOCY 1840b, The Corporation Douglas Rogers
Survey of the rise, diversity, and power of the capitalist corporation in global contexts, with a focus on the 20th and 21st centuries. Topics include: the corporation as legal entity and the social and cultural consequences of this status; corporations in

the colonial era; relationships among corporations, states, and non-governmental organizations in Western and non-Western contexts; anti-corporate critique and response; corporate social responsibility; and race, gender, and indigeneity. HU, SO o Course cr

* **ANTH 2252a / RLST 3300a / SAST 3760a, Religion, Place, and Space** Harini Kumar
This seminar explores why 'placemaking' is significant for practitioners of various religions worldwide. From the holy city of Mecca to the sacred landscape of Banaras in India, religious traditions are tethered to sacred geographies. These locations are often physical sites imbued with sacred energies and social meaning. Religious activities can occur in churches or mosques, forests or mountains, community centers, public squares, or homes. The course materials consider specific religious sites and contexts (including those on the Yale campus), examining how these places simultaneously become sites of worship, articulations of identity and heritage, claims of political significance, and hubs of social and emotional life. Special attention is given to how space and place are gendered, racialized, and shaped by emotions, senses, and memories. HU, SO

* **ANTH 2275a / ARCG 2275a, The Green Hell and the Mother Serpent: Amazonian Archaeology, Ethnography, and Politics** Richard Burger
Survey and seminar discussing the archaeology and ethnography of greater Amazonia, along with the political stakes of this heritage for modern Indigenous communities in the region. Introduces students to the varied geography and ecology of greater Amazonia, before delving into topics such as: the archaeological record of domestication and landscape investment by past Indigenous societies; the ethnographic and historical records of their descendants; the contested spheres of knowledge production in anthropology that underpins both of these records; and the modern political struggles that Indigenous communities face today amid deforestation and the pursuit of economic development. SO

ANTH 2294b / ARCG 2294b, The Ancient Maya Oswaldo Chinchilla Mazariegos
Introduction to the archaeological study of ancient Maya civilization in southern Mexico and northern Central America. Maya origins and modes of adaptation to a tropical forest environment; political history of the Classic Maya and competing theories about their collapse; overviews of Maya art, calendar, and writing. SO

ANTH 2403b, Primate Conservation David Watts
A study of nonhuman primates threatened by deforestation, habitat disturbance, hunting, and other human activities; the future of primate habitats, especially tropical rainforests, as they are affected by local and global economic and political forces. Examination of issues in primate conservation, from the principles of conservation biology and rainforest ecology to the emergence of diseases such as AIDS and Ebola and the extraction of tropical resources by local people and by transnational corporations. SO

ANTH 2442a, Human Evolutionary Biology and Life History Richard Bribiescas
The range of human physiological adaptability across environments and ecologies. Effects of energetic constraints on growth, reproduction, and behavior within the context of evolution and life history theory, with special emphasis on traditional non-Western societies. SC, SO o Course cr

ANTH 2480b, Evolution of Primate Intelligence David Watts
Discussion of the extent and evolutionary origins of cognitive abilities in primates (prosimians, monkeys, apes, and humans). Topics include the role of ecological and social factors as evolutionary forces; "ape language" studies; and whether any nonhuman primates possess a "theory of mind." SO o Course cr

* **ANTH 2504a, Molecular Anthropology** Serena Tucci
This course is a perfect introduction for anyone interested in understanding how genetics can help us answer fundamental questions in human evolution and population history. The course studies the basic principles of population genetics, molecular evolution, and genetic data analysis. Topics include DNA and human origins, human migrations, genetic adaptation, ancient DNA, and Neandertals. By the end of this course, students learn about the processes that generate and shape genetic variation, as well as the molecular and statistical tools used to reconstruct human evolutionary history. SC

ANTH 2530a / WGSS 2230a, Evolutionary Biology of Female Bodies Claudia Valeggia
Evolutionary, biosocial, and situated perspectives on the female body. Physiological, ecological, social and cultural aspects of the development of female bodies from puberty through menopause and aging, with special attention to lived experiences. Variation in female life histories in a variety of cultural and ecological settings. Examples from both traditional and modern societies. SC o Course cr

* **ANTH 2660a / ARCG 2660a, Being Human: The Neanderthal Dilemma** Jessica Thompson and Hannah Keller
Who were Neanderthals, and how were they different from us? Since their discovery in 1856, they have fascinated the public with their position as our closest, yet extinct, relatives. For decades Neanderthals were portrayed as nasty, brutish, and passively lacking the talent and innovation that allowed humans to survive and thrive. Recently, they have become celebrated as our close cousins or even just another group of ancient humans. But what does modern science say about Neanderthal life and extinction, and what do Neanderthals tell us about ourselves? By asking the question "were Neanderthals human," this course examines what it actually means to *be* human. Students learn the archaeological, fossil, and biomolecular records of Neanderthals, early modern humans, and other contemporaneous human relatives. They also learn the foundations of human evolutionary science, with a focus on the Middle and Late Pleistocene (770,000 to 11,500 years ago), when the genus *Homo* diversified into as many as seven species–including our own. SC, SO

ANTH 2844b, Modern Southeast Asia Erik Harms
This course offers a comprehensive introduction to the extraordinary diversity of Southeast Asian peoples, cultures, and political economy. Broadly focused on the nation-states that have emerged since the end of World War II (Brunei, Burma [Myanmar], Cambodia, Indonesia, East Timor, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam), the course explores the benefits and limits to a regional perspective. Crossing both national and disciplinary boundaries, the course introduces students to key elements of Southeast Asian geography, history, language and literature, belief systems, marriage and family, music, art, agriculture, industrialization and urbanization, politics and government, ecological challenges, and economic change. In addition to providing a broad and comparative survey of "traditional" Southeast Asia,

the course places special emphasis on the intellectual and practical challenges associated with modernization and development, highlighting the ways different Southeast Asian nations contend with the forces of globalization. The principle readings include key works from a multidisciplinary range of fields covering anthropology, art, economics, geography, history, literature, music, and political science. No prior knowledge of Southeast Asia is expected. SO o Course cr

* **ANTH 3075b / ARCG 3075b, Anthropology of Mobile Societies** William Honeychurch
The social and cultural significance of the ways that hunter-gatherers, pastoral nomads, maritime traders, and members of our own society traverse space. The impact of mobility and transport technologies on subsistence, trade, interaction, and warfare from the first horse riders of five thousand years ago to jet-propulsion tourists of today. SO

ANTH 3116La / ARCG 3116La, Introduction to Archaeological Laboratory Sciences Ellery Frahm
Introduction to techniques of archaeological laboratory analysis, with quantitative data styles and statistics appropriate to each. Topics include dating of artifacts, sourcing of ancient materials, remote sensing, and microscopic and biochemical analysis. Specific techniques covered vary from year to year. SC

* **ANTH 3136b / ARCG 3136b / EPS 3360b, Geoarchaeology** Ellery Frahm
A survey of the numerous ways in which theories, approaches, techniques, and data from the earth and environmental sciences are used to address archaeological research questions. A range of interfaces between archaeology and the geological sciences are considered. Topics include stratigraphy, geomorphology, site formation processes, climate reconstruction, site location, and dating techniques. Prior introductory coursework in archaeology or geology (or instructor permission) suggested. SC, SO

* **ANTH 3185b / ARCG 3185b, Archaeological Ceramics** Anne Underhill
Archaeological methods for analyzing and interpreting ceramics, arguably the most common type of object found in ancient sites. Focus on what different aspects of ceramic vessels reveal about the people who made them and used them. SO

* **ANTH 3297a / ARCG 3297a, Archaeology of East Asia** Staff
East and Southeast Asia have increasingly emerged as hotspots for global political, economic, and cultural interactions. What were the roots and social processes that gave rise to such systems? In this seminar, we explore archaeological evidence for the development of social and political organization and religious practices, using selected examples from East and Southeast Asia spanning approximately 5000 BCE to 1500 CE. We examine four key themes: (1) the origins and timing of plant and animal domestication, (2) the emergence and impact of early metallurgy, (3) patterns of interregional interaction, and (4) the rise of sociopolitical complexity. Using a comparative archaeological perspective—focusing on settlement patterns, urbanism, craft production, monumentality, and diverse material culture—we examine how both local factors and long-distance connections shaped these trajectories. We conclude the course with a reflection on the role of archaeology in contemporary society, particularly in countries where the past is actively curated, celebrated, and contested. No background in archaeology or East/Southeast Asian studies is required. SO

* **ANTH 3304a / AMST 3304a / ER&M 3304a / HUMS 3304a / SOCY 3104a, Ethnography & Journalism** Madiha Tahir
While each is loathed to admit it, journalism and ethnography are cousins in some respects interested in (albeit distinct) modes of storytelling, translation, and interpretation. This methods course considers these shared grounds to launch a cross-comparative examination. What can the practies of each field and method—journalism and ethnography—tell us about the other? How do journalists and ethnographers engage ideas about the truth? What can they learn from each other? Students spend the first four weeks studying journalistic methods and debates before shifting to ethnographic discussions, and finally, comparative approaches to writing; data and evidence; experience and positionality. HU, SO

* **ANTH 3594a, Methods and Research in Molecular Anthropology I** Serena Tucci
The first part of a two-term practical introduction to molecular analysis of anthropological questions. Discussion of genetics and molecular evolution, particularly as they address issues in anthropology, combined with laboratory sessions on basic tools for genetic analysis and bioinformatics. Development of research projects to be carried out in ANTH 395. SC 0 Course cr

* **ANTH 3595b, Methods and Research in Molecular Anthropology II** Serena Tucci
The second part of a two-term practical introduction to molecular analysis of anthropological questions. Design and execution of laboratory projects developed in ANTH 394. Research involves at least ten hours per week in the laboratory. Results are presented in a formal seminar at the end of the term. Prerequisite: ANTH 394.

* **ANTH 3684b / ARCG 3684b, Zooarchaeology** Jessica Thompson
This course deals with the analysis of animal remains from archaeological sites ("zooarchaeology"). It covers the history and epistemological development of zooarchaeology, its theoretical underpinnings, major debates, approaches, methodological advances, and relationship to sister disciplines (e.g., paleoecology, paleontology). The course includes basic identification of the major groups of animal remains recovered from archaeological sites, with an emphasis on vertebrate bones and teeth. It offers tools and insights from taphonomy–the reconstruction of the processes that occur as organisms transition from living creatures into assemblages of archaeological remains. The first half of the class deals with specific methods in the context of major issues, and the second half examines "big" issues in zooarchaeology: early evidence for human consumption of animal tissues, ancient forager diets and environments, dietary resource intensification and animal domestication, and insights from animal bones into social identity. Discussions are followed by practical components that involves the identification and/or analysis of specimens using microscopic and macroscopic approaches. WR, SC, SO

* **ANTH 3710a, Anthropological Theory and the Post Colonial Encounter** Jane Lynch
Key texts in the theoretical development of sociocultural anthropology. Theorists include Karl Marx, Max Weber, Emile Durkheim, Franz Boas, Zora Neale Hurston, Sidney Mintz, Bernard Cohn, Michel Foucault, Edward Said, Antonio Gramsci, Sherry Ortner, and Joan Scott. SO 0 Course cr

* **ANTH 3720b, Field Methods in Cultural Anthropology** Jane Lynch
The fundamentals of cultural anthropology methods. The foundations of fieldwork approaches, including methods, theories, and the problem of objectivity. WR, SO

* **ANTH 3807b / EP&E 4256b, Reparation, Repair, Reconciliation: Reckoning with Slavery and Colonialism in Global Perspective** Yukiko Koga
Imperial reckoning for slavery, imperialism, and colonialism has gained new momentum in recent years, from official apologies for colonial violence to reparations lawsuits filed in Asia, Europe, and the US for slavery, genocide, and massacres, to demands for the return of bodily remains and cultural artifacts from established cultural institutions. This seminar explores how these new attempts for belated imperial reckoning are reshaping relations between former empires and their ex-colonies. It approaches imperial reckoning as a site for redressing not only the original violence but also the transitional *injustice* incurred in the process of the unmaking of empire, which calls for post-imperial reckoning. Drawing on examples from recent cases, this course explores what it means to belatedly reckon with imperial violence today. What does it mean to reckon with imperial violence through legal means, decades after the dissolution of empires? What is the role of law in belated redress? How is historical responsibility articulated and by whom? Who is responsible for what, then and now? What are the stakes in reckoning with distant, yet still alive, pasts? Why and how does it matter today for those of us who have no direct experience of imperial violence? This course approaches these questions through an anthropological exploration of concepts such as debt, gift, moral economy, structural violence, complicity and implication, and abandonment. Prerequisites: Instructor permission required. HU, SO

* **ANTH 3809a, Language and Culture** Paul Kockelman
The relations between language, culture, and cognition. What meaning is and why it matters. Readings in recent and classic works by anthropologists, linguists, psychologists, and philosophers. SO 0 Course cr

* **ANTH 3820b, Contemporary China through Ethnography and Film** Yukiko Koga
This course introduces students to contemporary China through ethnography and film. Global political economic forces are dramatically reshaping the Chinese landscape—by the end of next decade more than half of its 1.3 billion people will live in cities. The China of today is unfolding within these cities, where generational change and social disparities are sharpened, new consumption patterns and identities take shape, and conflicts among the city-dwellers, nouveau riche, and labor migrants play out. The ethnographic texts and films in this course capture how these changes are experienced in everyday life. We examine the lure and disillusionment of "modern life," a buzzword in today's China, and how the major socio-economic and cultural transformations of the present relate to the past. SO

* **ANTH 3821b / MMES 3321b / SOCY 3433b / WGSS 3321b, Middle East Gender Studies** Marcia Inhorn
The lives of women and men in the contemporary Middle East explored through a series of anthropological studies and documentary films. Competing discourses surrounding gender and politics, and the relation of such discourse to actual practices of everyday life. Feminism, Islamism, activism, and human rights; fertility, family, marriage, and sexuality. SO

* **ANTH 3858b / SAST 3040b, Corporations & Communities** Jane Lynch
Can communities redefine corporations? How do corporations shape everyday life? To whom are they responsible? This course examines the relationship between commerce, society, and culture through a diverse set of case studies that are rooted in both global and local histories. Students learn about Henry Ford's rubber plantations

in the Amazon, family firms in Italy, how the East India Company shaped the modern multinational, the first company town to be established and run by an Indian firm, transnational "stakeholder" arrangements to compensate injured garment workers in Bangladesh, and the rise of "corporate social responsibility" culture. The goal of this course is not to define the relationship between corporations and communities as singular or obvious, but rather, to draw out the variety of factors—economic, historical, social, and cultural—that shape commercial interactions, institutional cultures, and claims about market ethics and social responsibility. HU, SO

* **ANTH 3873b / SAST 3830b, Water and Society: Culture, Life, and Values** Staff
Water has become an urgent theme not just in current anthropology, but in development studies and environmental studies more generally. Beyond questions of scarcity and sustainability, water allows human life to flourish, and without water, there would be no civilization. Yet water is not equitably distributed across time or space, leading to contestation and conflict around water. Against such a background of strife, this course examines how human beings have related to water, to other life forms, and to each other through the control of water, in different historical moments and different parts of the world. The seminar is organized around four porous thematic clusters: (i) "urban water", to do with cities and urban industrial life; (ii) "agrarian water", to do with rivers, irrigation systems, and agrarian life; (iii) "rural water", to do with coasts, lakes, dams and rural life; and (iv) and "living water", to do with social, cultural and political values, and human and more-than-human life. This seminar introduces students to the everyday values of water, as well as the everyday politics of water, including the production of water and its attendant politics at the level of the nation-state as well as the city municipality while also being attentive to the moral ecologies of water. By studying water in different ways through the lens of culture, environment, social justice, and spirituality or faith, students develop a nuanced understanding of development, urbanization, environmental justice, and climate change. HU, SO

ANTH 3880b / LING 2190b, Introduction to Linguistic Phylogenetics Edwin Ko
The goal of linguistic phylogenetics is to establish the relationships among the world's languages. This course surveys the history of linguistic phylogenetics that has employed quantitative and computational methods in the past century. Another goal of the course is to provide students with an overview of more recent computational methods originally developed for studying evolutionary biology but extended and adapted for use in studying linguistic change. WR, SO 0 Course cr

* **ANTH 3950a, Middle Eastern Migrations** Clayton Goodgame
Much modern scholarship on the Middle East takes for granted a sedentary perspective on society and social change. Cultures, religions, kinship systems, economies, and political ideologies are imagined, explicitly or implicitly, to emerge in territories bounded by the Westphalian limits of the nation-state. This course re-examines the societies of the modern Middle East from the perspective of the pilgrim, the refugee, the traveller, and the trader. Where traditional approaches took sedentariness and stasis as their starting point, we will begin with movement, displacement, uprootedness, and migration. Readings will explore how migration and movement have shaped the region's social, cultural, and economic structures over time. But rather than focus on case studies in particular countries, we will follow the flow of peoples, objects, capital, and ideas wherever they take us, from Egypt and Lebanon to India, the Netherlands, and Chile. Readings are organized by theme, from economic migration and wartime

displacement to religious pilgrimage and intellectual exchange. There is some focus on the modern and contemporary periods but we will be engaging both historical and ethnographic research and modes of analysis. SO

* **ANTH 3968a / LAST 3068a, Science Stories: Communicating Discovery Across Cultures** Diego Golombek

How do scientists share their discoveries beyond the lab—and why does it matter? In an age of misinformation, climate crisis, and global health challenges, communicating science is no longer optional: it's a core scientific responsibility. This course invites students from the natural and exact sciences—and anyone curious about the power of knowledge—to explore how to turn complex ideas into stories that inspire, inform, and empower diverse audiences. Blending theory and practice, we will experiment with different media platforms: from writing and museum exhibits to live performance and digital storytelling. Special attention will be given to cultural context: how does science communication change across borders, languages, and worldviews? For students affiliated with CLAIS, the course will also offer deeper engagement with Latin American approaches to science, narrative, and public dialogue. Students will leave the course with practical communication skills, a portfolio of creative work, and a critical understanding of how science lives in society—not just as facts and data, but as a shared human endeavor.

* **ANTH 4071a, Pre Thesis Senior Essay Research** Richard Bribiescas

For students who wish to investigate an area of anthropology not covered by regular departmental offerings. The two-term project must terminate with at least a term paper or its equivalent. No student may take more than two terms for credit. To apply for admission, a student should present a prospectus and bibliography to the director of undergraduate studies no later than the third week of the term. Written approval from the faculty member who will direct the student's reading and writing must accompany the prospectus. This course is followed by ANTH 4091.

* **ANTH 4072a, Readings in Anthropology** Richard Bribiescas

For students who wish to investigate an area of anthropology not covered by regular departmental offerings. The project must terminate with at least a term paper or its equivalent. No student may take more than two terms for credit. To apply for admission, a student should present a prospectus and bibliography to the director of undergraduate studies no later than the third week of the term. Written approval from the faculty member who will direct the student's reading and writing must accompany the prospectus.

* **ANTH 4091a, Writing the Senior Essay** Richard Bribiescas

Supervised investigation of some topic in depth. The course requirement is a long essay to be submitted as the student's senior essay. By the end of the third week of the term in which the essay is written, the student must present a prospectus and a preliminary bibliography to the director of undergraduate studies. Written approval from an Anthropology faculty adviser and an indication of a preferred second reader must accompany the prospectus.

* **ANTH 4101b / ARCG 4101b / EAST 4101b, Archaeological Plant Remains from East Asia and Beyond** Staff

Archaeology asks who we are, and how did humanity get to where it is today. This course explores the subfield of archaeobotany that is dedicated to understanding

the same questions through the analysis of plant remains from archaeological sites. Students gain foundational knowledge of archaeobotanical methods, the kinds of plant remain studied, and key research themes including climate and ecology, subsistence economies, plant domestication and spread, and non-food plant uses. There is a long history of research on archaeological plant remains in East Asia. We examine how ancient peoples interacted with their environments mainly through macro plant evidence, i.e. seeds and fruits. We discuss the social impact of choices people made about different kinds of domesticated and wild plants for foods and for production of objects for daily life. The course also highlights contemporary advancements in theories and methodologies within the discipline, supported by case studies from around the globe, with a particular emphasis on East Asia. SO

* **ANTH 4120b / EAST 4120b, Islam and Communist Modernities in Central Asia and Xinjiang** Staff

In the early 20th century, Central Asia and Xinjiang—two Muslim-majority regions with a shared history—fell under the rule of two communist states, the USSR and China. Both states facilitated the emergence of local nations while launching aggressive secularization policies aimed at suppressing local Islamic beliefs and practices. This course takes a comparative approach to the interwoven trajectories of Islam, nation-building, and secularization in Central Asia and Xinjiang. In so doing, it pursues two overarching objectives. The first is to trace the major historical events that have shaped these regions since the late 19th century. The second is to examine the main theoretical frameworks scholars have employed to better understand these historical transformations. Key conceptual questions explored in this course include: What is nationalism and how did Central Asian nations emerge? What is Islam as an object of scholarly inquiry? What is secularism, and how does it shape and regulate religion? How did Soviet and Chinese secularization campaigns transfigure Islam in Central Asia and Xinjiang? What forces facilitate the ongoing ethnocide of the Uyghurs in Xinjiang? HU

* **ANTH 4121a / EAST 4121a, Asian Foodways in the "Anthropocene"** Staff

Together with other creatures on the earth, we have formed food chains. In the "Anthropocene," people have discovered food, improved it, and lived with it. The rich and varied definitions of food have also enabled humans, the animal at the top of the food chains, to create many new ones. Food enters and becomes a part of the human body; in other words, the food we consume has become ourselves. How we define food also determines the way in which we relate to other living beings. We will explore cultural practices of food chains in East Asian societies, with a focus on China, Japan, and South Korea. class will guide students to think about the origins, production, and creation of food, as well as the politics, ethics, and technologies that are intertwined with the circulation of food. By reading ethnographies of food, this class provides students with the theoretical and methodological means to observe and analyze perhaps the most common thing in life. Food is not just a static object, but part of the global food chains that are constantly circulating, and part of the circulation with the human body. SO

* **ANTH 4122a / EAST 4122a, The Rise of Biosovereignty: Biopolitics, Technology, and Governance** Staff

This seminar critically explores the concept of "biosovereignty"—a framework of ideas and practices through which the state safeguards and utilizes biological resources

—to examine how East Asian countries have conceptualized and governed "life" through science and technology. Through this seminar, the goal is to develop a critical understanding of "biosovereignty" and to use the concept to analyze how East Asian states have perceived "life" and "life forms" as assets and properties, as well as to discuss the stakes and implications of their biosovereignty practices. Themes such as the genetic makeup of crops, traditional medicines, seed wars, stem cells, pandemics, and human DNA inform our discussions. We also discuss how international political organizations envision biosovereignty through international treaties and projects. SO

* **ANTH 4150a / ARCG 4150a, Analysis of Lithic Technology** Oswaldo Chinchilla Mazariegos

Introduction to the analysis of chipped and ground stone tools, including instruction in manufacturing chipped stone tools from obsidian. Review of the development of stone tool technology from earliest tools to those of historical periods; relevance of this technology to subsistence, craft specialization, and trade. Discussion of the recording, analysis, and drawing of artifacts, and of related studies such as sourcing and use-wear analysis. SO

* **ANTH 4217a / ARCG 4217a, Maya Hieroglyphic Writing** Oswaldo Chinchilla Mazariegos

Introduction to the ancient Maya writing system. Contents of the extant corpus, including nametags, royal and ritual commemorations, dynastic and political subjects, and religious and augural subjects; principles and methods of decipherment; overview of the Maya calendar; comparison with related writing systems in Mesoamerica and elsewhere in the ancient world. SO

* **ANTH 4292b / ARCG 4292b / NELC 3210b, Imaging Ancient Worlds in Museum Collections** Klaus Wagensonner and Agnete Lassen

What is Digitization of Cultural Heritage? What are its merits, challenges, and best practices? The course highlighst the documentation and interpretation of archaeological artifacts, in particular artifacts from Western Asia. The primary goal of the course is the use of new technologies in computer graphics, including 3D imaging, to support current research in archaeology and anthropology. The course does put particular emphasis on the best practices of digitizing artifacts in collections. The prime study subjects are the artifacts housed in the Yale Babylonian Collection (https://babylonian-collection.yale.edu). For some background information on the Collection see here. Students engage directly with the artifacts while practicing the various imaging techniques. HU 0 Course cr

* **ANTH 4553b / HLTH 4250, Global Health: Practice and Policy** Catherine Panter-Brick

Current debates in global health have focused specifically on health disparities, equity, and policy. This *advanced undergraduate seminar class* is designed for students seeking to develop an interdisciplinary understanding of health research, practice, and policy. Each week, we address issues of importance for research and policy, and apply theory, ethics, and practice to global health debates and case studies. The class encourages critical thinking regarding the promotion of health equity. WR, SO

ANTH 4564a or b / ARCG 4564a or b / E&EB 4564 / EEB 3464a or b, Human Osteology Eric Sargis
A lecture and laboratory course focusing on the characteristics of the human skeleton and its use in studies of functional morphology, paleodemography, and paleopathology. Laboratories familiarize students with skeletal parts; lectures focus on the nature of bone tissue, its biomechanical modification, sexing, aging, and interpretation of lesions. SC, SO o Course cr

* **ANTH 4590a, Health of Indigenous Peoples** Claudia Valeggia
From the highlands of the Andes to the lowlands of the Amazon basin and the frozen circumpolar steppes, from subsistence farmers and herders to hunter-gatherer groups, indigenous populations are changing their lifestyle so rapidly, and sometimes so profoundly, that it is difficult to follow the pace of the transformation. Indigenous peoples always fare far worse than non-indigenous ones in terms of health status. No matter where one looks, there are substantial health disparities between indigenous and non-indigenous populations in the form of mortality and morbidity gaps. We go over the epidemiological landscape of indigenous populations and discuss causes of death and sickness, which vary from population to population. We then expand on some of the possible interactive causes of these disparities, particularly the role that globalization and market integration is having in shaping the health situation of indigenous peoples. Finally, we discuss the current surge of Global Health Programs, mainly at academic or research institutions in the northern hemisphere and the contribution of anthropology to those programs. SO

* **ANTH 4669b / ARCG 4669b, Evolution of Human Diet** Jessica Thompson
This seminar examines human nutrition and subsistence behavior from an evolutionary perspective. It begins with human nutritional literature and discussions of our biological requirements, then moves into comparison of modern human dietary ecology with those of other primates, especially our closest living relatives, the great apes. We then turn to literature that demonstrates the methods and theoretical approaches that are currently used to reconstruct past diets. As we begin to follow the evidence for changes in subsistence in the hominin lineage, case studies using these methods are integrated into discussions of *how* we know what we do about past nutrition. The course spends time on key issues and debates such as changes from closed-habitat to open-habitat foraging, the origins of meat-eating, the role of extractive foraging in human social systems, variation in hunter-forager subsistence systems, the origins of domestication, and the phenomenon of fad diets in industrialized nations. Prerequisite: one of ANTH 061, ANTH 267, ANTH 116, or by instructor permission. WR, SC, SO

* **ANTH 4818b / ER&M 4518b and ER&M 6606b / SPAN 4618b / WGSS 4518b, Multi-Sited Ethnography: Trans-Atlantic Port Cities in Colombia and Spain** Eda Pepi and Ana Ramos-Zayas
Critical to colonial, imperial, and capitalist expansion, the Atlantic offers a dynamic setting for adapting ethnographic practices to address questions around interconnected oppressions, revolts, and revolutions that are foundational to global modernity. Anchored in a Spanish and a Colombian port city, this course engages trans-Atlantic 'worlding' through a multi-sited and historically grounded ethnographic lens. Las Palmas—the earliest mid-Atlantic port and Europe's first settler colony in Africa—and Cartagena—once the principal gateway connecting Spain and its American empire—illuminate urgent contemporary issues such as climate, displacement, inter-regional

subjectivities, and commerce. During a spring recess field experience (March 8–16, 2026), students immerse themselves for four nights each in Las Palmas and Cartagena, developing critical "tracking" skills that bridge ethnographic practice with cultural theory. Preparation for fieldwork includes an on-campus curriculum, organized around Cartagena and Las Palmas, and sessions with Yale Ethnography Hub faculty, covering different methodologies. As part of this broader programming, the curriculum delves into trans-Atlantic migrations from the Middle East, South Asia, and Africa that have transformed port cities, labor and aesthetic practices, class-making racial formations, and global geopolitics. After recess, the course shifts toward independent work, as students synthesize field-collected data and insights into a collaborative multimodal group project and individual ethnographic papers. Interested students must apply by November 1st via the course website. Students may withdraw by the university deadlines in April. Prerequisite: Conversational and reading proficiency in Spanish. Readings are in English and Spanish, with assignments accepted in either language. HU

* **ANTH 4824a / ANTH 5824a / EAST 3122a, Politics of Memory** Yukiko Koga
This course explores the role of memory as a social, cultural, and political force in contemporary society. How societies remember difficult pasts has become a contested site for negotiating the present. Through the lens of memory, we examine complex roles that our relationships to difficult pasts play in navigating issues we face today. This course explores this politics of memory that takes place in the realm of popular culture and public space. The class asks such questions as: How do you represent difficult and contested pasts? What does it mean to enable long-silenced victims' voices to be heard? What are the consequences of re-narrating the past by highlighting past injuries and trauma? Does memory work heal or open wounds of a society and a nation? Through examples drawn from the Holocaust, the atomic bombing in Hiroshima, the Vietnam War, genocide in Indonesia and massacres in Lebanon, to debates on confederacy statues, slavery, and lynching in the US, this course approaches these questions through an anthropological exploration of concepts such as memory, trauma, mourning, silence, voice, testimony, and victimhood. HU, SO

* **ANTH 4841b / ANTH 441 / MMES 4430b / WGSS 4430b, Gender and Citizenship in the Middle East** Eda Pepi
This seminar explores the complex interplay between gender, sexuality, and citizenship in the Middle East and North Africa. We examine how they are both shaped by and shape experiences of nationality, migration, and statelessness. Highlighting how gender and sexual minorities, and the gendered regulation of life, more broadly, both animate and contest colonial legacies tied to a racialized notion of "modernity." Through ethnography, history, and literature, students confront a political economy of intimacies that continuously reshape what it means to be or not to be a citizen. Our approach extends beyond borders and laws to include the everyday acts of citizenship that rework race, religion, and ethnicity across transnational fronts. We discuss how people navigate their lives in the everyday, from the ordinary poetry of identity and belonging to the spectacular drama of war and conflict. Our goal is to challenge orientalist legacies that dismiss theoretical insights from scholarship on and from this region by labeling it as focused on exceptional cases instead of addressing "universal" issues. Instead, we take seriously that the specific historical and social contexts of the Middle East and North Africa reveal how connections based on gender and sexuality within and across

families and social classes are deeply entwined with racial narratives of state authority and political sovereignty on a global scale. SO

* **ANTH 4848a, Medical Anthropology at the Intersections: Theory and Ethnography**
Marcia Inhorn
The field of medical anthropology boasts a rich theoretical and empirical tradition, in which critically acclaimed ethnographies have been written on topics ranging from local biologies to structural violence. Many scholars engage across the social science and humanities disciplines, as well as with medicine and public health, offering both critiques and applied interventions. This medical anthropology seminar showcases the theoretical and ethnographic engagements of nearly a dozen leading medical anthropologists, with a focus on their canonical works and their intersections across disciplines. Prerequisite: A prior medical anthropology course or permission of instructor. SO o Course cr

* **ANTH 4852a, Society and International Development** Louisa Lombard
In commonsense understandings, development is about improving economic metrics, like gross domestic product. Development is inherently progressivist: development projects strive to improve the present, and more importantly, the future. But in the midst of those seemingly straightforward goals and benchposts, society intervenes. It turns out that even the simplest projects to improve the human condition have a wide range of surprising, unintended consequences. In this course, we develop qualitative social science methods (ways of asking questions and ways of answering them) to better grapple with the inherently social contexts in which international development plays out. Instructor permission required. SO

* **ANTH 4855a / WGSS 4459a, Masculinity and Men's Health** Marcia Inhorn
Ethnographic approaches to masculinity and men's health around the globe. Issues of ethnographic research design and methodology; interdisciplinary theories of masculinity; contributions of men's health studies from Western and non-Western sites to social theory, ethnographic scholarship, and health policy. SO RP

* **ANTH 4865b / AMST 4459b / ANTH 465, Multispecies Worlds** Kathryn Dudley
This seminar explores the relational and material worlds that humans create in concert with other-than-human species. Through an interdisciplinary analysis of the problematic subject of anthropology—Anthropos—we seek to pose new questions about the fate of life worlds in the present epoch of anthropogenic climate change. Our readings track circuits of knowledge from anthropology and philosophy to geological history, literary criticism, and environmental studies as we come to terms with the loss of biodiversity, impending wildlife extinctions, and political-economic havoc wrought by global warming associated with the Anthropocene. A persistent provocation guides our inquiry: What multispecies worldings become possible to recognize and cultivate when we dare to decenter the human in our politics, passions, and aspirations for life on a shared planet? SO

* **ANTH 4883a / SAST 3030a, In Ordinary Fashion** Jane Lynch
Clothing fashions not only our bodies but also our experiences in and claims about the world. It has been used to define the nature and radical possibilities of indigeneity, anti-colonial nationalism, counter-cultural narratives, and capitalist critiques. At the same time, dress–and its social and legal regulation–also creates and reinforces social hierarchies, systems of morality, and forms of exclusion. This course centers these

competing social realities and histories using clothing as a way into understanding the poetics and politics of everyday life. Readings include ethnographies and social histories of textiles, fashion, and the manufacture of garments including cases from India, Guatemala, Italy, China, Sri Lanka, Bangladesh, Trinidad, and the United States. SO

* **ANTH 4895a / PSYC 480, Fathers and Fatherhood: Evolution and Behavior**
Eduardo Fernandez-Duque
What does it mean to be a father? We explore this question for humans and for other animals where "dads" also play a major role in the care of the young. We will focus on the evolutionary and behavioral sciences, while acknowledging that human behavior cannot be fully understood without attention to social and cultural contexts. Our readings cover the disciplines of biological anthropology, psychology, animal behavior, sociology, human development, ecology and evolution, public health, and medicine. Background on evolutionary biology, biology, psychology, animal behavior and/or ecology, biological anthropology. This could be the result of advanced high-school courses or college-level ones. SO

Applied Mathematics (AMTH)

AMTH 640b / CPSC 6400b / MATH 6400b, Topics in Numerical Computation
Vladimir Rokhlin
This course discusses several areas of numerical computing that often cause difficulties to non-numericists, from the ever-present issue of condition numbers and ill-posedness to the algorithms of numerical linear algebra to the reliability of numerical software. The course also provides a brief introduction to "fast" algorithms and their interactions with modern hardware environments. The course is addressed to Computer Science graduate students who do not necessarily specialize in numerical computation; it assumes the understanding of calculus and linear algebra and familiarity with (or willingness to learn) either C or FORTRAN. Its purpose is to prepare students for using elementary numerical techniques when and if the need arises.

AMTH 999a, Directed Reading Anna Gilbert
In-depth study of elliptic partial differential equations.

AMTH 2220a or b / MATH 2220a or b, Linear Algebra with Applications Staff
Matrix representation of linear equations. Gauss elimination. Vector spaces. Linear independence, basis, and dimension. Orthogonality, projection, least squares approximation; orthogonalization and orthogonal bases. Extension to function spaces. Determinants. Eigenvalues and eigenvectors. Diagonalization. Difference equations and matrix differential equations. Symmetric and Hermitian matrices. Orthogonal and unitary transformations; similarity transformations. Students who plan to continue with upper level math courses should instead consider MATH 225 or 226. After MATH 115 or equivalent. May not be taken after MATH 225 or 226. QR

AMTH 2320b / MATH 2320b, Advanced Linear Algebra with Applications Ian Adelstein
This course is a natural continuation of MATH 222. The core content includes eigenvectors and the Spectral Theorem for real symmetric matrices; singular value decomposition (SVD) and principle component analysis (PCA); quadratic forms, Rayleigh quotients and generalized eigenvalues. We also consider a number

of applications: optimization and stochastic gradient descent (SGD); eigen-decomposition and dimensionality reduction; graph Laplacians and data diffusion; neural networks and machine learning. A main theme of the course is using linear algebra to learn from data. Students complete (computational) projects on topics of their choosing. Prerequisites: MATH 120 and MATH 222, 225, or 226. This is not a proof-based course. May not be taken after MATH 340 (previously MATH 240. QR

AMTH 2440a or b / MATH 2440a or b, Discrete Mathematics Staff
Basic concepts and results in discrete mathematics: graphs, trees, connectivity, Ramsey theorem, enumeration, binomial coefficients, Stirling numbers. Properties of finite set systems. Prerequisite: MATH 115 or equivalent. Some prior exposure to proofs is recommended (ex. MATH 225). QR

AMTH 2470b / MATH 2470b, Intro to Partial Differential Equations Ruoyu Wang
Introduction to partial differential equations, wave equation, Laplace's equation, heat equation, method of characteristics, calculus of variations, series and transform methods, and numerical methods. Prerequisites: MATH 222 or 225 or 226, MATH 246 or ENAS 194 or equivalents. QR

AMTH 3220a / MATH 3220a, Geometric and Topological Methods in Machine Learning Smita Krishnaswamy
This course provides an introduction to geometric and topological methods in data science. Our starting point is the manifold hypothesis: that high dimensional data live on or near a much lower dimensional smooth manifold. We introduce tools to study the geometric and topological properties of this manifold in order to reveal relevant features and organization of the data. Topics include: metric space structures, curvature, geodesics, diffusion maps, eigenmaps, geometric model spaces, gradient descent, data embeddings and projections, and topological data analysis (TDA) in the form of persistence homology and their associated "barcodes." We see applications of these methods in a variety of data types. Prerequisites: MATH 225 or 226; MATH 255 or 256; MATH 302; and CPSC 112 or equivalent programming experience. Students who completed MATH 231 or 250 may substitute another analysis course level 300 or above in place of MATH 302. QR, SC

* **AMTH 3420a / ECE 4320a, Linear Systems** A Stephen Morse
Introduction to finite-dimensional, continuous, and discrete-time linear dynamical systems. Exploration of the basic properties and mathematical structure of the linear systems used for modeling dynamical processes in robotics, signal and image processing, economics, statistics, environmental and biomedical engineering, and control theory. Prerequisite: MATH 222 or permission of instructor. QR

AMTH 3610b / S&DS 3610b, Data Analysis Brian Macdonald
Selected topics in statistics explored through analysis of data sets using the R statistical computing language. Topics include linear and nonlinear models, maximum likelihood, resampling methods, curve estimation, model selection, classification, and clustering. Extensive use of the R programming language. Experience with R programming (from e.g. S&DS 106, S&DS 220, S&DS 230, S&DS 242), probability and statistics (e.g. S&DS 106, S&DS 220, S&DS 238, S&DS 241, or concurrently with S&DS 242), linear algebra (e.g. MATH 222, MATH 225, MATH 118), and calculus is required. This course is a prerequisite for S&DS 425 and may not be taken after S&DS 425. QR

AMTH 3640b / EENG 454 / S&DS 3640b, Information Theory Yihong Wu
Foundations of information theory in communications, statistical inference, statistical mechanics, probability, and algorithmic complexity. Quantities of information and their properties: entropy, conditional entropy, divergence, redundancy, mutual information, channel capacity. Basic theorems of data compression, data summarization, and channel coding. Applications in statistics and finance. After STAT 241. QR

* **AMTH 3660b / CPSC 3660b / ECON 3366b, Intensive Algorithms** Anna Gilbert
Mathematically sophisticated treatment of the design and analysis of algorithms and the theory of NP completeness. Algorithmic paradigms including greedy algorithms, divide and conquer, dynamic programming, network flow, approximation algorithms, and randomized algorithms. Problems drawn from the social sciences, Data Science, Computer Science, and engineering. For students with a flair for proofs and problem solving. Only one of CPSC 365, CPSC 366, or CPSC 368 may be taken for credit. Prerequisites: MATH 244 and CPSC 223. QR

AMTH 4200a / MATH 4210a, The Mathematics of Data Science Staff
This course aims to be an introduction to the mathematical background that underlies modern data science. The emphasis is on the mathematics but occasional applications are discussed (in particular, no programming skills are required). Covered material may include (but is not limited to) a rigorous treatment of tail bounds in probability, concentration inequalities, the Johnson-Lindenstrauss Lemma as well as fundamentals of random matrices, and spectral graph theory. Prerequisite: MATH 305. QR, SC

* **AMTH 4820a, Research Project** John Wettlaufer
Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. The student must submit a written report about the results of the project. May be taken more than once for credit.

* **AMTH 4910a, Senior Project** John Wettlaufer
Individual research that fulfills the senior requirement. Requires a faculty supervisor and the permission of the director of undergraduate studies. The student must submit a written report about the results of the project.

Applied Physics (APHY)

* **APHY 0500a / ENAS 0500a / PHYS 0500a, Science of Modern Technology and Public Policy** Daniel Prober
Examination of the science behind selected advances in modern technology and implications for public policy, with focus on the scientific and contextual basis of each advance. Topics are developed by the participants with the instructor and with guest lecturers, and may include nanotechnology, quantum computation and cryptography, renewable energy technologies, optical systems for communication and medical diagnostics, transistors, satellite imaging and global positioning systems, large-scale immunization, and DNA made to order. Enrollment limited to first-year students. SC

* **APHY 0800b and APHY 1000b / ENAS 0800b / EPS 0800b / EVST 0080b and EVST 1000b / PHYS 0800b and PHYS 1000b, Energy, Environment, and Public Policy** Daniel Prober
The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non–science majors with strong backgrounds in math and science. Tours are

be conducted of major examples of good energy design at Yale, including the Yale Power Plant and Kroon Hall. Students who take this course are not eligible to take APHY 100. Prerequisites: High school chemistry, physics, and Math. Calculus is not required. Enrollment limited to first-year students. QR, SC

APHY 1100a / ENAS 110, The Technological World Owen Miller
How does modern technology work? This course introduces the scientific concepts underpinning a wide variety of technologies, including smartphones, medical-imaging techniques, solar-energy conversion, and virtual-reality headsets. Pivotal to each of these example technologies is electromagnetism—the study of electric and magnetic fields and waves—which will comprise the scientific foundation of the course, with additional forays into quantum mechanics (solar cells, medical imaging), information theory (digital communication), and cryptography (code-breaking, cryptocurrency). The course is open to all students. We use trigonometry (sines and cosines, angles, etc.) throughout. QR, SC

APHY 1510a or b / ENAS 1510a or b / PHYS 1510a or b, Multivariable Calculus for Engineers Staff
An introduction to multivariable calculus focusing on applications to engineering problems. Topics include vector-valued functions, vector analysis, partial differentiation, multiple integrals, vector calculus, and the theorems of Green, Stokes, and Gauss. Prerequisite: MATH 115 or equivalent. QR

APHY 1940a or b / ENAS 1940a or b, Ordinary and Partial Differential Equations with Applications Staff
Basic theory of ordinary and partial differential equations useful in applications. First- and second-order equations, separation of variables, power series solutions, Fourier series, Laplace transforms. Prerequisites: ENAS 151 or MATH 120 or equivalent, and knowledge of matrix-based operations. QR

APHY 3200a / ECE 3200a, Semiconductor Devices Hong Tang
An introduction to the physics of semiconductors and semiconductor devices. Topics include crystal structure; energy bands in solids; charge carriers with their statistics and dynamics; junctions, p-n diodes, and LEDs; bipolar and field-effect transistors; and device fabrication. Additional lab one afternoon per week. Prepares for EENG 325 and 401. Recommended preparation: EENG 200. PHYS 180 and 181 or permission of instructor QR, SC

APHY 3220a, Electromagnetic Waves and Devices Michael Hatridge
Introduction to electrostatics and magnetostatics, time varying fields, and Maxwell's equations. Applications include electromagnetic wave propagation in lossless, lossy, and metallic media and propagation through coaxial transmission lines and rectangular waveguides, as well as radiation from single and array antennas. Occasional experiments and demonstrations are offered after classes. Prerequisites: PHYS 180, 181, or 200, 201. QR, SC

APHY 3930a / PHYS 3930a, Einstein and the Birth of Modern Physics A Douglas Stone
The first twenty-five years of the 20th century represent a turning point in human civilization as for the first time mankind achieved a systematic and predictive understanding of the atomic level constituents of matter and energy, and the mathematical laws which describe the interaction of these constituents. In addition,

the General Theory of Relativity opened up for the first time a quantitative study of cosmology, of the history of the universe as a whole. Albert Einstein was at the center of these breakthroughs, and also became an iconic figure beyond physics, representing scientist genius engaged in pure research into the fundamental laws of nature. This course addresses the nature of the transition to modern physics, underpinned by quantum and relativity theory, through study of Einstein's science, biography, and historical context. It also presents the basic concepts in electromagnetic theory, thermodynamics and statistical mechanics, special theory of relativity, and quantum mechanics which were central to this revolutionary epoch in science. Prerequisites: Two terms of PHYS 170, 171, or PHYS 180, 181, or PHYS 200, 201, or PHYS 260, 261, or one term of any of these course with permission of instructor. QR, SC

APHY 4180b / ECE 4021b, Advanced Electron Devices Mengxia Liu
The science and technology of semiconductor electron devices. Topics include compound semiconductor material properties and growth techniques; heterojunction, quantum well and superlattice devices; quantum transport; graphene and other 2D material systems. Formerly EENG 418. Prerequisite: EENG 320 or equivalent. QR, SC

* **APHY 4200a / PHYS 4500a, Thermodynamics and Statistical Mechanics** Eduardo Higino da Silva Neto
This course is subdivided into two topics. We study thermodynamics from a purely macroscopic point of view and then we devote time to the study of statistical mechanics, the microscopic foundation of thermodynamics. Prerequisites: PHYS 301, 410, and 440 or permission of instructor. QR, SC

APHY 4390a / PHYS 4390a, Basic Quantum Mechanics John Sous
The basic concepts and techniques of quantum mechanics essential for solid-state physics and quantum electronics. Topics include the Schrödinger treatment of the harmonic oscillator, atoms and molecules and tunneling, matrix methods, and perturbation theory. Prerequisites: PHYS 181 or 201, PHYS 301, or equivalents, or permission of instructor. QR, SC

APHY 4480a / PHYS 4480a, Solid State Physics I Yu He
The first term of a two-term sequence covering the principles underlying the electrical, thermal, magnetic, and optical properties of solids, including crystal structure, phonons, energy bands, semiconductors, Fermi surfaces, magnetic resonances, phase transitions, dielectrics, magnetic materials, and superconductors. Prerequisites: APHY 322, 439, PHYS 420. QR, SC

APHY 4490b / PHYS 4490b, Solid State Physics II Vidvuds Ozolins
The second term of the sequence described under APHY 448. QR, SC

APHY 4580a / PHYS 4580a, Principles of Optics with Applications Hui Cao
Introduction to the principles of optics and electromagnetic wave phenomena with applications to microscopy, optical fibers, laser spectroscopy, and nanostructure physics. Topics include propagation of light, reflection and refraction, guiding light, polarization, interference, diffraction, scattering, Fourier optics, and optical coherence. Prerequisite: PHYS 430. QR, SC

* **APHY 4690a or b, Special Projects** Owen Miller
Faculty-supervised individual or small-group projects with emphasis on research (laboratory or theory). Students are expected to consult the director of undergraduate studies and appropriate faculty members to discuss ideas and suggestions for suitable

topics. This course may be taken more than once, is graded pass/fail, is limited to Applied Physics majors, and does not count toward the senior requirement. Permission of the faculty adviser and of the director of undergraduate studies is required.

* **APHY 4700a / ECON 4446a, Statistical Methods with Applications in Science and Finance** Sohrab Ismail-Beigi
Introduction to key methods in statistical physics with examples drawn principally from the sciences (physics, chemistry, astronomy, statistics, biology) as well as added examples from finance. Students learn the fundamentals of Monte Carlo, stochastic random walks, and analysis of covariance analytically as well as via numerical exercises. Prerequisites: ENAS 194, MATH 222, and ENAS 130, or equivalents. QR, SC

* **APHY 4710a and APHY 4720b, Senior Special Projects** Owen Miller
Faculty-supervised individual or small-group projects with emphasis on research (laboratory or theory). Students are expected to consult the director of undergraduate studies and appropriate faculty members to discuss ideas and suggestions for suitable topics. This course may be taken more than once and is limited to Applied Physics majors in their junior and senior years. Permission of the faculty adviser and of the director of undergraduate studies is required.

Arabic (ARBC)

ARBC 1100a, Elementary Modern Standard Arabic I Staff
Development of a basic knowledge of Modern Standard Arabic. Emphasis on grammatical analysis, vocabulary acquisition, and the growth of skills in speaking, listening, reading, and writing. L1 1½ Course cr

ARBC 1200b, Elementary Modern Standard Arabic II Staff
Continuation of ARBC 1100. Prerequisite: ARBC 1100 or requisite score on a placement test. L2 1½ Course cr

* **ARBC 1220a, Modern Standard Arabic for Heritage Learners I** Sarab Al Ani
This course is designed for students who have been exposed to Arabic—either at home or by living in an Arabic speaking country—but who have little or no formal training in the language. The main purpose of the course is to: build on the language knowledge students bring to the classroom to improve their skills and performance in the three modes of communication (Interpersonal, Presentational, and Interpretive), to fulfill various needs. Particular attention is paid to building, controlling, and mastering language structures. Effective study strategies are used in this course to strengthen writing skills in MSA. Various assignments and tasks are designed to improve the learner's understanding of several issues related to culture in various Arabic speaking countries. Prerequisite: Students must take the placement test or with permission of the instructor. L2

* **ARBC 1300a, Intermediate Modern Standard Arabic I** Muhammad Aziz Intensive review of grammar; readings from contemporary and classical Arab authors with emphasis on serial reading of unvoweled Arabic texts, prose composition, and formal conversation. Prerequisite: ARBC 120 or requisite score on a placement test. L3 1½ Course cr

* **ARBC 1320b, Modern Standard Arabic for Heritage Learners II** Sarab Al Ani
Continuation of ARBC 1220, MSA for Heritage Learners I. This course is designed for students who have been exposed to Arabic—either at home or by living in an Arabic-speaking country—but who have little or no formal training in the language. The main purpose of the course is to build on the language knowledge students bring to the classroom to improve their skills and performance in the three modes of communication (Interpersonal, Presentational, and Interpretive) in MSA to fulfill various needs. Particular attention is paid to building, controlling, and mastering language structures. Effective study strategies are used in this course to strengthen writing skills. Various assignments and tasks are designed to improve the learner's understanding of several issues related to culture in various Arabic speaking countries. Prerequisite: ARBC 1220 or successful completion of placement test or instructor permission. L3

ARBC 1360a, Beginning Classical Arabic I Staff
Introduction to classical Arabic, with emphasis on grammar to improve analytical reading skills. Readings include Qur'anic passages, literary material in both poetry and prose, biographical entries, and religious texts. Prerequisite: ARBC 1200 or permission of instructor. May be taken concurrently with ARBC 1300 or 1500. L3 RP

ARBC 1400b, Intermediate Modern Standard Arabic II Muhammad Aziz
Continuation of ARBC 1300. Prerequisite: ARBC 1300 or requisite score on a placement test. L4 1½ Course cr

ARBC 1460b, Beginning Classical Arabic II Staff
Continuation of ARBC 1360. Prerequisite: ARBC 1360 or permission of instructor. May be taken concurrently with ARBC 1400 or 1510. L4 RP

* **ARBC 1500a, Advanced Modern Standard Arabic I** Jonas Elbousty
Further development of listening, writing, and speaking skills. For students who already have a substantial background in Modern Standard Arabic. Prerequisite: ARBC 1400 or requisite score on a placement test. L5

* **ARBC 1510b, Advanced Modern Standard Arabic II** Jonas Elbousty
Continuation of ARBC 1500. Prerequisite: ARBC 1500 or requisite score on a placement test. L5

ARBC 1560a, Intermediate Classical Arabic I Staff
A course on Arabic grammar and morphology that builds on the skills acquired in ARBC 1460 or 5100, with emphasis on vocabulary, grammar, and reading skills and strategies. Readings drawn from a variety of genres, such as biography, history, hadith, and poetry. Previously ARBC 1580. Prerequisite: ARBC 1460 or 1510. L5, HU

* **ARBC 1610a, Arabic Narrative Prose** Muhammad Aziz
Close reading of selected novels by Naguib Mahfouz. Attention to idiomatic expressions, structural patterns, and literary analysis. Prerequisite: ARBC 1510 or requisite score on a placement test. May be repeated for credit. L5

* **ARBC 1650b / MMES 4465b, Arabic Seminar: Early Adab** Kevin van Bladel
Study and interpretation of classical Arabic texts for advanced students. The subtitle of this course changes depending on the materials covered. This term the course focuses on "Early Adab." Prerequisite: ARBC 1460, 1510, or permission of instructor. May be repeated for credit.

ARBC 1660b, Intermediate Classical Arabic II Staff
A continuation of Intermediate Classical Arabic grammar and morphology that builds on the skills acquired in ARBC 1560 or 5110, with emphasis on vocabulary, grammar, and reading skills and strategies. Readings drawn from a variety of genres, such as biography, history, hadith, and poetry." Previously ARBC 1590. Prerequisite: ARBC 1560. L5, HU

* **ARBC 1730b / ARBC 5980b, Tracing the Image of the Arab "Other"** Jonas Elbousty
This advanced Arabic language course places the modern Arabic novel in conversation with the west in an effort to uncover both dominant narratives regarding Arab identity, as well as counter narratives that present a challenge to these dominant narratives. We study the tradition of modern Arabic literature, looking specifically to the ways in which the image of the "other" is presented in Arabic narratives as well as the ways in which the image of the Arab is constructed through the others' literature. Readings, discussions, and written assignments will be in Arabic. Prerequisite: ARBC 1510. L5, HU

ARBC 1910a, Egyptian Arabic Randa Muhammed
A basic course in the Egyptian dialect of Arabic. Principles of grammar and syntax; foundations for conversation and listening comprehension. Prerequisite: ARBC 1300 or equivalent.

* **ARBC 4500b / LING 3270b / NELC 4530b, History of the Arabic Language** Kevin van Bladel
This course covers the development of the Arabic language from the earliest epigraphic evidence through the formation of the Classical 'Arabiyya and further, to Middle Arabic and Neo-Arabic. Readings of textual specimens and survey of secondary literature. Prerequisite: ARBC 1400 and permission of instructor.

Archaeological Studies (ARCG)

ARCG 1110a / HSAR 1110a, Introduction to the History of Art: Global Decorative Arts Staff
Global history of the decorative arts from antiquity to the present. The materials and techniques of ceramics, textiles, metals, furniture, and glass. Consideration of forms, imagery, decoration, and workmanship. Themes linking geography and time, such as trade and exchange, simulation, identity, and symbolic value. HU 0 Course cr

ARCG 1172b / ANTH 1172b, Great Hoaxes and Fantasies in Archaeology William Honeychurch
Examination of selected archaeological hoaxes, cult theories, and fantasies; demonstration of how archaeology can be manipulated to authenticate nationalistic ideologies, religious causes, and modern stereotypes. Examples of hoaxes and fantasies include the lost continent of Atlantis, Piltdown man, ancient giants roaming the earth, and alien encounters. Evaluation of how, as a social science, archaeology is capable of rejecting such interpretations about the past. SO

ARCG 2143a / CLCV 1701a / HSAR 3243a, Greek Art and Architecture Staff
Monuments of Greek art and architecture from the late Geometric period (c. 760 B.C.) to Alexander the Great (c. 323 B.C.). Emphasis on social and historical contexts. HU 0 Course cr

*** ARCG 2242b / NELC 2440b, Ancient Egyptian Materials and Techniques: Their Histories and Socio-Economic Implications** Gregory Marouard
This seminar investigates in detail ancient Egyptian materials, techniques, and industries through the scope of archaeology, history, and socioeconomical, textual as well as iconographic data. When possible ethnoarchaeological and experimental approaches of the antique chaine-operatoire are discussed in order to illustrate skills and professions that have now completely disappeared. This class is organized according to various themes within a diachronical approach, from the 4th millennium BC to the Roman Period. Copper and precious metals, construction stones, hard stones and gems, glass and faience production, imported wood or ivory, we explore multiple categories of materials, where and how they were collected or exchanged, the way these products were transported, transformed, refined or assembled and the complex organization of the work involved and administration that was required in order to satisfy the tastes of Egyptian elites or their desires to worship their gods. Some other vernacular savoir-faire linked to the everyday life and the death is explored, through food production and mummification practices. The aim of this seminar is not only to give an overview of the history of techniques for this early civilization but, beyond how things were made, to acquire a more critical view of ancient Egyptian culture through the material culture and as well the strong economic and sociologic implications linked to their objects and constructions–rather than the usual focus on its temples and tombs. HU

*** ARCG 2275a / ANTH 2275a, The Green Hell and the Mother Serpent: Amazonian Archaeology, Ethnography, and Politics** Richard Burger
Survey and seminar discussing the archaeology and ethnography of greater Amazonia, along with the political stakes of this heritage for modern Indigenous communities in the region. Introduces students to the varied geography and ecology of greater Amazonia, before delving into topics such as: the archaeological record of domestication and landscape investment by past Indigenous societies; the ethnographic and historical records of their descendants; the contested spheres of knowledge production in anthropology that underpins both of these records; and the modern political struggles that Indigenous communities face today amid deforestation and the pursuit of economic development. SO

ARCG 2294b / ANTH 2294b, The Ancient Maya Oswaldo Chinchilla Mazariegos
Introduction to the archaeological study of ancient Maya civilization in southern Mexico and northern Central America. Maya origins and modes of adaptation to a tropical forest environment; political history of the Classic Maya and competing theories about their collapse; overviews of Maya art, calendar, and writing. SO

ARCG 2345a / NELC 2430a, Archaeology of Ancient Egypt—The Age of the Pyramids Gregory Marouard
This lecture course introduces the archaeology of ancient Egypt, beginning with an overview of the environment, climate, and history of the discipline, as well as the new archaeological methods used in contemporary fieldwork in Egypt. The course then explores ancient Egypt's origins, starting with the Predynastic and Early Dynastic Periods (5300–2800 BCE) and continuing chronologically to the great pyramids of the Old Kingdom (2800–2055 BCE) and the Middle Kingdom (2055–1700 BCE). It covers the historical framework, the evolution of ancient Egyptian art and architecture, and material culture, and includes specific case studies of important archaeological sites and

discoveries. This course is the first of two introductory lecture courses. However, it is not necessary to take both parts, and the order in which you take them does not matter. Discussion sections are included. HU 0 Course cr

* **ARCG 2660a / ANTH 2660a, Being Human: The Neanderthal Dilemma** Jessica Thompson and Hannah Keller
Who were Neanderthals, and how were they different from us? Since their discovery in 1856, they have fascinated the public with their position as our closest, yet extinct, relatives. For decades Neanderthals were portrayed as nasty, brutish, and passively lacking the talent and innovation that allowed humans to survive and thrive. Recently, they have become celebrated as our close cousins or even just another group of ancient humans. But what does modern science say about Neanderthal life and extinction, and what do Neanderthals tell us about ourselves? By asking the question "were Neanderthals human," this course examines what it actually means to *be* human. Students learn the archaeological, fossil, and biomolecular records of Neanderthals, early modern humans, and other contemporaneous human relatives. They also learn the foundations of human evolutionary science, with a focus on the Middle and Late Pleistocene (770,000 to 11,500 years ago), when the genus *Homo* diversified into as many as seven species–including our own. SC, SO

* **ARCG 3075b / ANTH 3075b, Anthropology of Mobile Societies** William Honeychurch
The social and cultural significance of the ways that hunter-gatherers, pastoral nomads, maritime traders, and members of our own society traverse space. The impact of mobility and transport technologies on subsistence, trade, interaction, and warfare from the first horse riders of five thousand years ago to jet-propulsion tourists of today. SO

ARCG 3116La / ANTH 3116La, Introduction to Archaeological Laboratory Sciences Ellery Frahm
Introduction to techniques of archaeological laboratory analysis, with quantitative data styles and statistics appropriate to each. Topics include dating of artifacts, sourcing of ancient materials, remote sensing, and microscopic and biochemical analysis. Specific techniques covered vary from year to year. SC

* **ARCG 3136b / ANTH 3136b / EPS 3360b, Geoarchaeology** Ellery Frahm
A survey of the numerous ways in which theories, approaches, techniques, and data from the earth and environmental sciences are used to address archaeological research questions. A range of interfaces between archaeology and the geological sciences are considered. Topics include stratigraphy, geomorphology, site formation processes, climate reconstruction, site location, and dating techniques. Prior introductory coursework in archaeology or geology (or instructor permission) suggested. SC, SO

* **ARCG 3185b / ANTH 3185b, Archaeological Ceramics** Anne Underhill
Archaeological methods for analyzing and interpreting ceramics, arguably the most common type of object found in ancient sites. Focus on what different aspects of ceramic vessels reveal about the people who made them and used them. SO

* **ARCG 3297a / ANTH 3297a, Archaeology of East Asia** Staff
East and Southeast Asia have increasingly emerged as hotspots for global political, economic, and cultural interactions. What were the roots and social processes that gave rise to such systems? In this seminar, we explore archaeological evidence for

the development of social and political organization and religious practices, using selected examples from East and Southeast Asia spanning approximately 5000 BCE to 1500 CE. We examine four key themes: (1) the origins and timing of plant and animal domestication, (2) the emergence and impact of early metallurgy, (3) patterns of interregional interaction, and (4) the rise of sociopolitical complexity. Using a comparative archaeological perspective—focusing on settlement patterns, urbanism, craft production, monumentality, and diverse material culture—we examine how both local factors and long-distance connections shaped these trajectories. We conclude the course with a reflection on the role of archaeology in contemporary society, particularly in countries where the past is actively curated, celebrated, and contested. No background in archaeology or East/Southeast Asian studies is required. SO

* **ARCG 3684b / ANTH 3684b, Zooarchaeology** Jessica Thompson
This course deals with the analysis of animal remains from archaeological sites ("zooarchaeology"). It covers the history and epistemological development of zooarchaeology, its theoretical underpinnings, major debates, approaches, methodological advances, and relationship to sister disciplines (e.g., paleoecology, paleontology). The course includes basic identification of the major groups of animal remains recovered from archaeological sites, with an emphasis on vertebrate bones and teeth. It offers tools and insights from taphonomy—the reconstruction of the processes that occur as organisms transition from living creatures into assemblages of archaeological remains. The first half of the class deals with specific methods in the context of major issues, and the second half examines "big" issues in zooarchaeology: early evidence for human consumption of animal tissues, ancient forager diets and environments, dietary resource intensification and animal domestication, and insights from animal bones into social identity. Discussions are followed by practical components that involves the identification and/or analysis of specimens using microscopic and macroscopic approaches. WR, SC, SO

* **ARCG 4101b / ANTH 4101b / EAST 4101b, Archaeological Plant Remains from East Asia and Beyond** Staff
Archaeology asks who we are, and how did humanity get to where it is today. This course explores the subfield of archaeobotany that is dedicated to understanding the same questions through the analysis of plant remains from archaeological sites. Students gain foundational knowledge of archaeobotanical methods, the kinds of plant remain studied, and key research themes including climate and ecology, subsistence economies, plant domestication and spread, and non-food plant uses. There is a long history of research on archaeological plant remains in East Asia. We examine how ancient peoples interacted with their environments mainly through macro plant evidence, i.e. seeds and fruits. We discuss the social impact of choices people made about different kinds of domesticated and wild plants for foods and for production of objects for daily life. The course also highlights contemporary advancements in theories and methodologies within the discipline, supported by case studies from around the globe, with a particular emphasis on East Asia. SO

* **ARCG 4150a / ANTH 4150a, Analysis of Lithic Technology** Oswaldo Chinchilla Mazariegos
Introduction to the analysis of chipped and ground stone tools, including instruction in manufacturing chipped stone tools from obsidian. Review of the development of stone tool technology from earliest tools to those of historical periods; relevance of this

technology to subsistence, craft specialization, and trade. Discussion of the recording, analysis, and drawing of artifacts, and of related studies such as sourcing and use-wear analysis. SO

* **ARCG 4217a / ANTH 4217a, Maya Hieroglyphic Writing** Oswaldo Chinchilla Mazariegos
Introduction to the ancient Maya writing system. Contents of the extant corpus, including nametags, royal and ritual commemorations, dynastic and political subjects, and religious and augural subjects; principles and methods of decipherment; overview of the Maya calendar; comparison with related writing systems in Mesoamerica and elsewhere in the ancient world. SO

* **ARCG 4292b / ANTH 4292b / NELC 3210b, Imaging Ancient Worlds in Museum Collections** Klaus Wagensonner and Agnete Lassen
What is Digitization of Cultural Heritage? What are its merits, challenges, and best practices? The course highlighst the documentation and interpretation of archaeological artifacts, in particular artifacts from Western Asia. The primary goal of the course is the use of new technologies in computer graphics, including 3D imaging, to support current research in archaeology and anthropology. The course does put particular emphasis on the best practices of digitizing artifacts in collections. The prime study subjects are the artifacts housed in the Yale Babylonian Collection (https://babylonian-collection.yale.edu). For some background information on the Collection see here. Students engage directly with the artifacts while practicing the various imaging techniques. HU o Course cr

* **ARCG 4471a or b and ARCG 4472a or b, Directed Reading and Research in Archaeology** Oswaldo Chinchilla Mazariegos
Qualified students may pursue special reading or research under the guidance of an instructor. A written statement of the proposed research must be submitted to the director of undergraduate studies for approval.

* **ARCG 4491a or b, Senior Research Project in Archaeology** Oswaldo Chinchilla Mazariegos
Required of all students majoring in Archaeological Studies. Supervised investigation of some archaeological topic in depth. The course requirement is a long essay to be submitted as the student's senior essay. The student should present a prospectus and bibliography to the director of undergraduate studies no later than the third week of the term. Written approval from the faculty member who will direct the reading and writing for the course must accompany the prospectus.

ARCG 4564a or b / ANTH 4564a or b / E&EB 4564 / EEB 3464a or b, Human Osteology Eric Sargis
A lecture and laboratory course focusing on the characteristics of the human skeleton and its use in studies of functional morphology, paleodemography, and paleopathology. Laboratories familiarize students with skeletal parts; lectures focus on the nature of bone tissue, its biomechanical modification, sexing, aging, and interpretation of lesions. SC, SO o Course cr

* **ARCG 4669b / ANTH 4669b, Evolution of Human Diet** Jessica Thompson
This seminar examines human nutrition and subsistence behavior from an evolutionary perspective. It begins with human nutritional literature and discussions of our biological requirements, then moves into comparison of modern human dietary ecology

with those of other primates, especially our closest living relatives, the great apes. We then turn to literature that demonstrates the methods and theoretical approaches that are currently used to reconstruct past diets. As we begin to follow the evidence for changes in subsistence in the hominin lineage, case studies using these methods are integrated into discussions of *how* we know what we do about past nutrition. The course spends time on key issues and debates such as changes from closed-habitat to open-habitat foraging, the origins of meat-eating, the role of extractive foraging in human social systems, variation in hunter-forager subsistence systems, the origins of domestication, and the phenomenon of fad diets in industrialized nations. Prerequisite: one of ANTH 061, ANTH 267, ANTH 116, or by instructor permission. WR, SC, SO

Architecture (ARCH)

ARCH 1001a, Introduction to Architecture Trattie Davies and Alexander Purves
Lectures and readings in the language of architecture. Architectural vocabulary, elements, functions, and ideals. Notebooks and projects required. Not open to first-year students. Required for all Architecture majors. HU

* **ARCH 1300b, Drawing Architecture** George Knight
Introduction to the visual and analytical skills necessary to communicate architectural ideas. Observation and documentation of architectural space on the Yale campus. Drawing exercises introduce the conventions of architectural representation: plan, section, elevation, and isometric drawings, as well as freehand perceptual drawings of architectural space.

* **ARCH 1301b, Materials in Architecture** Staff
Science and technology of basic building materials studied together with historic and current design applications. Skills and processes required to create, shape, and connect materials experienced through hands-on projects. Technical notebooks, drawings, design and build exercises, and projects required. Enrollment limited to 20. 0 Course cr

* **ARCH 1400b, Introduction to Structures** Staff
Basic principles governing the behavior of building structures. Developments in structural form combined with the study of force systems, laws of statics, and mechanics of materials and members and their application to a variety of structural systems. Prerequisites: trigonometry and some knowledge of calculus. Enrollment limited to 20. QR, SC

ARCH 1600b / URBN 1300b, Introduction to Urban Studies Staff
An introduction to key topics, research methods, and practices in urban studies, an interdisciplinary field of inquiry and action rooted in the experience of cities. As physical artifacts, the advent of large cities have reflected rapid industrialization and advanced capitalism. They are inseparable from the organization of economic life; the flourishing of cultures; and the formation of identities. They are also places where power is concentrated and inequalities are (re)produced. Debates around equity are filtered through urban environments, where struggles over jobs, housing, education, mobility, public health, and public safety are front and center. The course is organized as a colloquium with numerous guests. Accessible entirely online, there will also be live, in-person events, with social distancing and face masks/shields, available to students in New Haven. HU, SO 0 Course cr

ARCH 2000b / EVST 2000b / URBN 2000b, Scales of Design Bimal Mendis
Exploration of architecture and urbanism at multiple scales from the human to the world. Consideration of how design influences and shapes the material and conceptual spheres through four distinct subjects: the human, the building, the city, and the world. Examination of the role of architects, as designers, in constructing and shaping the inhabited and urban world. Lectures, readings, reviews and four assignments that address the spatial and visual ramifications of design.Not open to first-year students. Required for all Architecture majors. HU

ARCH 2001a / HSAR 3326a, History of Architecture to 1750 Staff
Introduction to the history of architecture from antiquity to the dawn of the Enlightenment, focusing on narratives that continue to inform the present. The course begins in Africa and Mesopotamia, follows routes from the Mediterranean into Asia and back to Rome, Byzantium, and the Middle East, and then circulates back to mediaeval Europe, before juxtaposing the indigenous structures of Africa and America with the increasingly global fabrications of the Renaissance and Baroque. Emphasis on challenging preconceptions, developing visual intelligence, and learning to read architecture as a story that can both register and transcend place and time, embodying ideas within material structures that survive across the centuries in often unexpected ways. HU o Course cr

*** ARCH 2104a / HSAR 4361a, How to Design a Renaissance Building** Morgan Ng
During the fifteenth and sixteenth centuries, European architects and their patrons conceived buildings of newfound scale and artistic ambition—buildings that vied in grandeur with the monuments of classical antiquity. Before realizing such structures, however, architects first had to draw and model them. What graphic mediums and tools allowed them to visualize such large, complex works? What imaginative processes fueled their creativity? What innovations did they borrow from other disciplines, such as painting, sculpture, archaeology, and the geometrical sciences? And to what extent can scholars today reconstruct these past practices? HU

ARCH 2105a / HIST 1755 / HSHM 2390, Reckoning Environmental Uncertainty: A Global History since 1100 Staff
This lecture course focuses on a series of historical episodes since 1100 C.E. that present different approaches to reckoning with environmental uncertainty. Topics range from environmental management during the Southern Song Dynasty to seafaring across the Pacific Ocean and from patchworks of agriculture and urban centers throughout the Indo-Gangetic plains to the proliferation of observatories across the globe to monitor weather patterns. What ties these diverse places and histories together is but one goal: to understand how strategies for claiming knowledge are entangled with environmental uncertainty. Steeped within the histories of science, technology, and the environment, the course presents a variety of approaches to how people have come to know the world around them and what they have done to account for environmental change. HU o Course cr

ARCH 2600a / AMST 1197a / HIST 1125a / HSAR 3219a / URBN 1101a, American Architecture and Urbanism Staff
Introduction to the study of buildings, architects, architectural styles, and urban landscapes, viewed in their economic, political, social, and cultural contexts, from precolonial times to the present. Topics include: public and private investment in the built environment; the history of housing in America; the organization of architectural

practice; race, gender, ethnicity and the right to the city; the social and political nature of city building; and the transnational nature of American architecture. HU
0 Course cr

ARCH 2601a / URBN 1102a, Civic Art: Introduction to Urban Design Staff
Introduction to the history, analysis, and design of the urban landscape. Principles, processes, and contemporary theories of urban design; relationships between individual buildings, groups of buildings, and their larger physical and cultural contexts. Case studies from New Haven and other world cities. HU 0 Course cr

* **ARCH 3000a, Methods and Form in Architecture I** Michael Schlabs and Anne Barrett
Analysis of architectural design of specific places and structures. Analysis is governed by principles of form in landscape, program, ornament, and space, and includes design methods and techniques. Readings and studio exercises required. Enrollment limited to 25. Open only to Architecture majors. 1½ Course cr

* **ARCH 3001b, Methods and Form in Architecture II** Staff
Continuation of ARCH 250. Analysis of architectural design of specific places and structures. Analysis is governed by principles of form in landscape, program, ornament, and space, and includes design methods and techniques. Readings and studio exercises required. 1½ Course cr

* **ARCH 3102a / URBN 3303a, History of Landscape in Western Europe and the United States: Antiquity to 1950** Warren Fuermann
This course is designed as an introductory survey of the history of landscape architecture and the wider, cultivated landscape in Western Europe and the United States from the Ancient Roman period to mid-twentieth century America. Included in the lectures, presented chronologically, are the gardens of Ancient Rome, medieval Europe, the early and late Italian Renaissance, 17th century France, 18th century Britain, 19th century Britain and America with its public and national parks, and mid-twentieth century America. The course focuses each week on one of these periods, analyzes in detail iconic gardens of the period, and placse them within their historical and theoretical context. HU RP

* **ARCH 3103b / URBN 3315b, Revolutionary Cities: Protest, Rebellion and Representation in Modern Urban Space** Alan Plattus
Cities have always been hotbeds of radical ideas and actions. Their cafes and taverns, drawing rooms and universities have been incubators of new ideas, revolutionary ideologies and debate, while their streets and public spaces have been the sites of demonstrations, protests, and uprisings. Since cities are key nodes in larger networks of trade and cultural exchange, these local events have often had a global audience and impact. This seminar explores the interaction of urban space and event, and the media and technologies of revolutionary representation, through case studies of particular cities at transformational moments in their development. These begin with Boston in the 1760s and 1770s, and may include Paris in 1789, 1830, 1848, 1871 and again in 1968, St. Petersburg in 1917, Beijing in 1949 and again in 1989, Havana in 1959, Prague, Berlin and Johannesburg and other cities in 1989, Cairo in 2011, Hong Kong in 2011–12, 2014 and 2019, and other urban sites of the Occupy and Black Lives Matter movements. Course work in modern history is recommended. HU

*** ARCH 3106b, Creativity, Innovation, and "The New"** Mark Gage
This seminar explores the role of "The New" in the design of our world. Through exploring the history of newness as an idea, its current understanding within philosophy, and examining its understanding in multiple creative fields today including art, architecture, product design, social microcultures, cars, food, fashion, and toys, students gain both knowledge about the role of "The New" in human society and are exposed to cutting-edge ideas in multiple disciplines. Through the study of emerging creative trends, detailed historic case studies, both philosophical and popular readings, and engaged group discussion we examine the very concept of "The New" from all possible angles—what it is, its history, why it is desired, the motivations of those that produce and promote it, who profits from it, and the morality of its continued rehearsal in a world with evolving ethics regarding the use of human labor and natural resources in the production of things. This course encourages students to consider these positions through not only research, presentations and discussion, but also speculative 'making' that challenges students to address the subject of "The New" themselves—through the very process of design. No particular skills or previous exposure to the design world is required. HU

*** ARCH 3109b / ER&M 1638b / WGSS 3334b, Making the Inclusive Museum: Race, Gender, Disability and the Politics of Display** Joel Sanders
BLM and COVID-19 have underscored the imperative for public institutions like art museums to reckon with a longstanding dilemma: museum architecture, working in relationship with the art it displays, perpetuation of white supremacy, heteronormativity, and ableism. This seminar uses the resources of the Yale University Art Gallery and the Yale Center for British Art to situate this contemporary challenge in a cultural and historical context by tracing the intertwined histories of art and gallery architecture from the 16th century to today. Looking back allows us to imagine alternative futures: we consider the work of contemporary scholars, artists, designers, and public health experts who are developing strategies for making 21st-century museums inclusive environments that promote multi-sensory experiences among people of different races, genders, and abilities. Instructor permission is required based on the submission of an Expression of Interest with the following info: Name, Class year, Major/Concentration, Email and a paragraph describing relevant experiences that would allow you to make a meaningful contribution to the class. HU RP

*** ARCH 3120a, Nonfiction Writing** Christopher Hawthorne
A seminar and workshop in the craft of nonfiction writing as pertains to a given subcategory or genre. Each section focuses on a different form of nonfiction writing and explores its distinctive features through a variety of written and oral assignments. Students read key texts as models and analyze their compositional strategies. They then practice the fundamentals of nonfiction in writing and revising their own essays. Section topics, which change yearly, are listed at the beginning of each term on the English department website. This course may be repeated for credit in a section that treats a different genre or style of writing; ENGL 121 and ENGL 3461 may not be taken for credit on the same topic. Formerly ENGL 421. WR, HU

*** ARCH 3304a / URBN 3603a, Urban Lab: An Urban World** Joyce Hsiang
Understanding the urban environment through methods of research, spatial analysis, and diverse means of representation that address historical, social, political, and environmental issues that consider design at the scale of the entire world. Through

timelines, maps, diagrams, collages and film, students frame a unique spatial problem and speculate on urbanization at the global scale. Prerequisites: For non-majors: permission of the instructor is required. For ARCH majors: ARCH 150, 200, and 280. HU 1½ Course cr

* **ARCH 3601a / URBN 3306a, Difference and the City** Justin Moore
Four hundred and odd years after colonialism and racial capitalism brought twenty and odd people from Africa to the dispossessed indigenous land that would become the United States, the structures and systems that generate inequality and white supremacy persist. Our cities and their socioeconomic and built environments continue to exemplify *difference*. From housing and health to mobility and monuments, cities small and large, north and south, continue to demonstrate intractable disparities. The disparate impacts made apparent by the COVID-19 pandemic and the reinvigorated and global Black Lives Matter movement demanding change are remarkable. Change, of course, is another essential indicator of *difference* in urban environments, exemplified by the phenomena of disinvestment or gentrification. This course explores how issues like climate change and growing income inequality intersect with politics, culture, gender equality, immigration and migration, technology, and other considerations and forms of disruption.

* **ARCH 4000a, Senior Studio** Adam Hopfner
Advanced problems with emphasis on architectural implications of contemporary cultural issues. The complex relationship among space, materials, and program. Emphasis on the development of representations—drawings and models—that effectively communicate architectural ideas. To be taken before ARCH 494. Enrollment limited to Architecture majors. 1½ Course cr

* **ARCH 4001b, Senior Project Design Studio** Gavin Hogben and Steven Harris
Individual design investigations, focusing on independence and precision in the deployment of design ideas. Reliance on visual and nonverbal presentations. Development of a three-dimensional component, such as large-scale mock details, or other visual means of presentation, which might include photography, film, video, or interactive media. Examination of the skills, topics, and preparation to support design research. 1½ Course cr

* **ARCH 4700a or b, Individual Tutorial** Michael Schlabs
Special courses may be established with individual members of the department only. The following conditions apply: (1) a prospectus describing the nature of the studio program and the readings to be covered must be approved by both the instructor and the director of undergraduate studies; (2) regular meetings must take place between student and instructor; (3) midterm and final reviews are required. For juniors and seniors with DUS approval; meetings by appointment with DUS.

* **ARCH 4701a or b, Individual Tutorial Lab** Michael Schlabs
n/a n/a ½ Course cr

* **ARCH 4900a / URBN 4900a, Senior Research Colloquium** Kyle Dugdale
Research and writing colloquium for seniors in the Urban Studies and History, Theory, and Criticism tracks. Under guidance of the instructor and members of the Architecture faculty, students define their research proposals, shape a bibliography, improve research skills, and seek criticism of individual research agendas. Requirements include proposal drafts, comparative case study analyses, presentations to faculty, and the formation of

a visual argument. Guest speakers and class trips to exhibitions, lectures, and special collections encourage use of Yale's resources.

* **ARCH 4910b / URBN 4910b, Senior Project** Kyle Dugdale
An essay or project in the student's area of concentration. Students in the history, theory, and criticism track or in the urban studies track pursue independent research with an adviser; this project must terminate in a senior essay.

Armenian (ARMN)

Art (ART)

* **ART 0514b, Research in the Making** Staff
Artistic research expands the research form to focus on haptic and tactile study of physical and historical objects. Through field trips to various special collections and libraries, including the Beinecke, the Yale Art Gallery, and the Map Collection, students respond to specific objects in the vast resources of Yale University. Group discussions, lectures, and critiques throughout the term help foster individual projects. Each student conducts research through the artistic mediums of drawing, photography, video, and audio, to slowly build an interconnected collection of research that is also an artwork. Enrollment limited to first-year students. HU

* **ART 0517b, Spaces of Marginality** Yaminay Chaudhri
This class looks at "space" from the perspective of the outsider; it lingers in the margins, peripheries, and shadows of contemporary urban space to encourage a critical analysis of everyday experience. Each week we will unpack normative and dominant spaces by developing a keen understanding of the marginal and invisible spaces that hold them up. Sara Ahmad's book, Queer Phenomenology, and Bell Hooks' essay, Choosing the Margin as a Space of Radical Openness, provides the guiding framework for our inquiries as we move through various spatial formations. We scale our inquiries: from the orientation of our bodies in the classroom, to space-making walks in New Haven, to historical analysis of exclusionary zoning policies along coastal Connecticut. Throughout the semester, readings and artwork connect students to struggles for space in different parts of the world, highlighting invisible infrastructures, inequities, and voices of resistance. Classes center student discussions of weekly themes built up using a host of readings, art works, and urban typologies. Enrollment limited to first-year students. HU

* **ART 0610a, Interdisciplinary Exploration For Making Fictional Worlds, Flying Machines, and Shaking Things Up** Nathan Carter
Whether you aspire to be an engineer, doctor, or astronaut, it can still be vital to dream and invent–by drawing and sculpting in order to generate ideas and develop strategies for learning how to make something out of nothing. In this course, students consider how artists and inventors have used seemingly unrelated materials and content in order to activate creative thinking and generative activity. Students engage in a wide variety of interdisciplinary activities such as drawing, sculpting, painting, printing, photography, reprographics, instrument-building and sound broadcasting. This course emphasizes experimenting with strategies for generating ideas, images and objects, and employs broad modes of creating, including elements of chance, spontaneity,

collaborating communally, and synthesizing disparate elements into the process of making. Enrollment limited to first-year students. HU

* **ART 0615a, Sculpture, Irrational Collaborative Play and Channeling Creativity** Nathan Carter
How do artists, writers, dancers, musicians, architects, designers, and performers break the tension of trying to generate something new and exciting? When do we feel the most free to create? This course explores strategies inspired by artists who use unstructured free play as a way to develop new ways of making art and generating new ideas, images, and objects. Students are introduced to group activities and actions such as the costumes created for Bauhaus School parties and the seemingly absurd, irrational games of Fluxus as a way to reinvent and energize their notions of how art could be created. Working collaboratively and individually, students use sculptural materials and the sculpture studios to create a space for their own inventions. Enrollment limited to first-year students.

* **ART 0706a, Art of the Printed Word** Jesse Marsolais
Introduction to the art and historical development of letterpress printing and to the evolution of private presses. Survey of hand printing; practical study of press operations using antique platen presses and the cylinder proof press. Material qualities of printed matter, connections between content and typographic form, and word/image relationships. Enrollment limited to first-year students. HU

* **ART 0740b / ENGL 0440b, Writer as Designer, Designer as Writer** Rachel Kauder Nalebuff and Alice Chung
This seminar invites us to explore the boundaries between written and visual expression. Students with a background or interest in visual art learn to harness their voices as writers, and writers learn tools for how words take on new meaning through visual compositions. The course investigates the relationship between form and content through the creation of three projects—an interview, a manual, and an essay—each of which is written, designed, and physically produced using a variety of tools at our disposal. Through readings, in-class discussion and exercises, as well as workshops, we consider the ways language and ideas can be communicated to others through different media, and how that media in itself also carries meaning. The aim of the course is to playfully blur the categories of "writer" and "designer" so that we can be both at once: messengers. Previously ENGL 041. Enrollment limited to first-year students. This course does not count toward the Creative Writing Concentration for English majors. HU

* **ART 0907b, Art of the Game** Sarah Stevens-Morling
Introduction to interactive narrative through video game programming, computer animation, and virtual filmmaking. Topics include interactive storytelling, video game development and modification, animation, and virtual film production. Students produce a variety of works including web-based interactive narratives, collaboratively built video games, and short game-animated film production (machinima). Enrollment limited to first-year students.

* **ART 1111a or b, Visual Thinking** Staff
An introduction to the language of visual expression, using studio projects to explore the fundamental principles of visual art. Students acquire a working knowledge of visual syntax applicable to the study of art history, popular culture, and art.

Projects address all four major concentrations (graphic design, printing/printmaking, photography, and sculpture). No prior drawing experience necessary. Open to all undergraduates. Required for Art majors. HU RP

* **ART 1514a or b, Basic Drawing** Staff
An introduction to drawing, emphasizing articulation of space and pictorial syntax. Class work is based on observational study. Assigned projects address fundamental technical and conceptual problems suggested by historical and recent artistic practice. No prior drawing experience required. Open to all undergraduates. Required for Art majors. HU

* **ART 1516a, Color Practice** Sophy Naess
Study of the interactions of color, ranging from fundamental problem solving to individually initiated expression. The collage process is used for most class assignments. HU RP

* **ART 1530a or b, Painting Basics** Staff
A broad formal introduction to basic painting issues, including the study of composition, value, color, and pictorial space. Emphasis on observational study. Course work introduces students to technical and historical issues central to the language of painting. Recommended for non-majors and art majors. HU RP

* **ART 1610b, Sculpture Basics** Sandra Burns
Concepts of space, form, weight, mass, and design in sculpture are explored and applied through basic techniques of construction and material, including gluing and fastening, mass/weight distribution, hanging/mounting, and surface/finishing. Hands-on application of sculptural techniques and review of sculptural ideas, from sculpture as a unified object to sculpture as a fragmentary process. The shops and classroom studio are available during days and evenings throughout the week. Enrollment limited to 12. Recommended to be taken before ART 1620–1625. HU RP

ART 1620b, Introduction to Sculpture: Wood Staff
Introduction to wood and woodworking technology through the use of hand tools and woodworking machines. The construction of singular objects; strategies for installing those objects in order to heighten the aesthetic properties of each work. How an object works in space and how space works upon an object. HU

ART 1621a, Introduction to Sculpture: Metal Aki Sasamoto
Introduction to Metal emphasizes working with metal through the framework of artistic, architectural and cultural forms. This course features a comprehensive application of construction in relation to concept. We will examine the ways in which the meaning of a work derives from materials and the form those materials take. Instruction in welding and general metal fabrication techniques will be taught, facilitating the completion of artworks. HU

* **ART 1732a or b, Introduction to Graphic Design** Staff
A studio introduction to visual communication, with emphasis on the visual organization of design elements as a means to transmit meaning and values. Topics include shape, color, visual hierarchy, word-image relationships, and typography. Development of a verbal and visual vocabulary to discuss and critique the designed world. HU RP

* **ART 1745b, Introduction to Digital Video** Neil Goldberg
Introduction to the formal principles and basic tools of digital video production. Experimental techniques taught alongside traditional HD camera operation and sound capture, using the Adobe production suite for editing and manipulation. Individual and collaborative assignments explore the visual language and conceptual framework for digital video. Emphasis on the spatial and visual aspects of the medium rather than the narrative. Screenings from video art, experimental film, and traditional cinema. RP

* **ART 1784a or b, 3D Modeling for Creative Practice** Staff
Through creation of artwork, using the technology of 3D modeling and virtual representation, students develop a framework for understanding how experiences are shaped by emerging technologies. Students create forms, add texture, and illuminate with realistic lights; they then use the models to create interactive and navigable spaces in the context of video games and virtual reality, or to integrate with photographic images. Focus on individual project development and creative exploration. Frequent visits to Yale University art galleries. This course is a curricular collaboration with The Center for Collaborative Arts and Media at Yale (CCAM). RP

* **ART 1836a or b, Black & White Photography Capturing Light** Staff
An introductory course in black-and-white photography concentrating on the use of 35mm cameras. Topics include the lensless techniques of photograms and pinhole photography; fundamental printing procedures; and the principles of film exposure and development. Assignments encourage the variety of picture-forms that 35mm cameras can uniquely generate. Student work is discussed in regular critiques. Readings examine the invention of photography and the flâneur tradition of small-camera photography as exemplified in the work of artists such as Henri Cartier-Bresson, Helen Levitt, Robert Frank, and Garry Winogrand. HU RP

* **ART 1838a or b, Digital Photography Seeing in Color** Staff
The focus of this class is the digital making of still color photographs with particular emphasis on the potential meaning of images in an overly photo-saturated world. Through picture-making, students develop a personal visual syntax using color for effect, meaning, and psychology. Students produce original work using a required digital SLR camera. Introduction to a range of tools including color correction, layers, making selections, and fine inkjet printing. Assignments include regular critiques with active participation and a final project. HU RP

* **ART 1942a or b / FILM 1620a or b, Introductory Documentary Filmmaking** Staff
The art and craft of documentary filmmaking. Basic technological and creative tools for capturing and editing moving images. The processes of research, planning, interviewing, writing, and gathering of visual elements to tell a compelling story with integrity and responsibility toward the subject. The creation of nonfiction narratives. Issues include creative discipline, ethical questions, space, the recreation of time, and how to represent "the truth." RP

ART 1985a, Principles of Animation Ben Hagari
The physics of movement in animated moving-image production. Focus on historical and theoretical developments in animation of the twentieth and twenty-first centuries as frameworks for the production of animated film and visual art. Classical animation and digital stop-motion; fundamental principles of animation and their relation to traditional and digital technologies. RP

* **ART 2525b, Adventures in Self-Publishing** Alexander Valentine
This course introduces students to a wide range of directions and legacies within arts publishing, including the development of fanzines, artists' books, small press comics, exhibition catalogues, "just in time" publications, and social media. Students are given instruction in the Yale School of Art's Print Shop on various printing and binding methods leading to the production of their own publications both individually and in collaboration. Attention is paid to ways artists' publishing has been used to bypass traditional cultural and institutional gatekeepers, to foster community and activism, to increase visibility and representation, and to distribute independent ideas and narratives. Students explore the codex as it relates to contemporary concepts of labor, economics, archives, media forms, information technologies, as well as interdisciplinary and social art practices. Supplemental readings and visits to the Haas Arts Library, the Beinecke Rare Book and Manuscript Library, YUAG's prints and drawings study room, and the Odds and Ends Art Book Fair provide case studies and key examples for consideration. Prerequisite: ART 1111.

* **ART 2545a, Digital Drawing** Anahita Vossoughi
Digital techniques and concepts as they expand the possibilities of traditional drawing. The structure of the digital image; print, video, and projected media; creative and critical explorations of digital imaging technologies. Historical contexts for contemporary artworks and practices utilizing digital technologies. Group critiques of directed projects. The second half of the course is focused on individual development and exploration. Enrollment limited.

* **ART 2611a, Sculpture as Object: Documentation, Preservation, Conservation** Kameelah Rasheed
Introduction to concepts of design and form in sculpture. Exploration of the use of wood, including both modern and traditional methods of carving, lamination, assemblage, and finishing. Fundamentals of metal processes such as welding, cutting, grinding, and finishing may also be explored on a limited basis. Group discussion complements the studio work. The shops and the studio are available during days and evenings throughout the week. HU

ART 2743a, Introduction to Typeface Design Nina Stoessinger
Procedure for building typeface designs on the basis of historical sources. Aesthetic issues presented by single letters and their interrelationships; principles of letterform rendering and spacing, optical mechanics, cultural signals. Use of the type-design program RoboFont to digitize letterforms on screen and turn them into usable fonts. No prerequisites, this course is explicitly for beginning type designers. More advanced students see ART 7443.

* **ART 2764a, Typography!** Alice Chung
An intermediate graphic-design course in the fundamentals of typography, with emphasis on ways in which typographic form and visual arrangement create and support content. Focus on designing and making books, employing handwork, and computer technology. Typographic history and theory discussed in relation to course projects. Prerequisite: ART 1732. RP

* **ART 2766a, Graphic Design Histories** Geoff Kaplan
This three-part course examines the role of alternative and underground media in the formation of social movements in the United States from the mid- to late 20th century,

specifically focusing on graphic design. Our animating question throughout the term is: "can graphic design be understood as a form of activism or protest?" Looking to histories of graphic innovation linked to diverse social interests (among them, Black power, women's liberation, queer activism, environmentalism, the antiwar movement, independence movements, etc.), we will study the ways in which collective practices fashion the image of a culture in times of pronounced political change: as a vehement challenge to the dominance of official media and a critical form of self-representation. One goal is to consider the implications of such work in the present, a moment in which corporate media, misinformation campaigns, and algorithmic capitalism has exerted decisive control over public discourse. HU

* **ART 2836b, Picturing at the Peabody** Lisa Kereszi
A photography course that is taught both in the School of Art and also in the classrooms and Imaging Studio of the Peabody Museum, making use of the museum's collections for subject matter and inspiration. Students choose a specific subject, theme, or collection in the museum, research it, and investigate it photographically on site or in the studio to create an original body of work that directly relates to themes and objects found in the museum's collections. Students work collaboratively to curate a semi-public exhibition in the Peabody Museum building of their photographic artwork to put on view, as well as an exhibit of actual objects chosen in the course of their photography project research. The course studies other artists' archival exhibits and makes use of an existing exhibition of actual objects curated from the collections to learn the history of photography, as well as learn how an exhibition of archival material is researched, organized, and executed. Prerequisite: ART 1838 or permission of instructor.

* **ART 2839a, Photographic Storytelling** Tommy Kha
An introductory course that explores the various elements of photographic storytelling, artistic styles, and practices of successful visual narratives. Students focus on creating original bodies of work with digital cameras. Topics include camera handling techniques, photo editing, sequencing, and photographic literacy. Student work is critiqued throughout the term, culminating in a final project. Through a series of lectures, readings and films, students are introduced to influential works in the global canon of photographic history as well as issues and topics by a multitude of voices in contemporary photography and the documentary tradition. Prerequisites: ART 1836 or 1838, or permission of the instructor.

* **ART 2941a / FILM 1610a, Introductory Film Writing and Directing** Sahraa Karimi
Problems and aesthetics of film studied in practice as well as in theory. In addition to exploring movement, image, montage, point of view, and narrative structure, students photograph and edit their own short videotapes. Emphasis on the writing and production of short dramatic scenes. Priority to majors in Art and in Film & Media Studies. RP

ART 2943a / FILM 2940a, Cinematography: History, Theory, Practice Jonathan Andrews
This course serves to introduce students to the artistic practice of cinematography in the context of its history from the birth of cinema to the present. Readings, screenings, and discussions exploring film history are complemented by readings, workshops, and

creative assignments exploring the tools, techniques, conventions, and scientific and psychological foundations of the cinematographer's art.

* **ART 2984b, Technology and the Promise of Transformation** Sarah Oppenheimer
Inherent transformative qualities are embedded within technology; it transforms our lives, the way we perceive or make art, and conversely, art can reflect on these transformations. Students explore the implementation of technologies in their art making from pneumatic kinetics, bioengineering, AR, VR, and works assisted by artificial intelligence—modes of production that carry movement, degradation, and displacement of authorship. The student practice is supported by readings, independent research, and essays on diverse artists and designers who make use of technology in their work or, on the contrary, totally avoid it. This course is a curricular collaboration with The Center for Collaborative Arts and Media at Yale (CCAM).

* **ART 2985b, Digital Animation** Michael Rader
Introduction to the principles, history, and practice of animation in visual art and film. Historical and theoretical developments in twentieth- and twenty-first-century animation used as a framework for making digital animation. Production focuses on digital stop-motion and compositing, as well as 2-D and 3-D computer-generated animation. Workshops in relevant software. Prerequisites: ART 1111, 1514, or 1745, and familiarity with Macintosh-based platforms.

ART 3155a, Cave Paintings to Graffiti: History of Mural Painting Kymberly Pinder
Murals have communicated religious, political and personal messages to communities for millennia. Muralists take risks when they commit to an art practice that is outside the museum or gallery. They must negotiate both multiple, unpredictable publics, their own privacy, and the socio-political 'publicness' of their work. Community-engaged artmaking provokes, mobilizes, and forever alters the spaces and audiences it encounters. Course topics include Michelangelo's Sistine Chapel, Mexican muralists and revolution, civic mural movements in the U.S., graffiti as a global phenomenon, and murals in the region, such as New Haven and New York City. This course includes art history through practice, creating a more integrated way of learning the history of mural making, from prehistory to the present, by collectively painting a mural in the Peabody Museum. Working with a local muralist, students learn how to navigate the process of creating a mural, from the proposal to the budget to the community programming and the execution. There are no artistic skills required. HU

* **ART 3485a / AMST 2208 / TDPS 3308a, Choreographies of Everyday Life** Emily Coates
A studio-based inquiry into the epochal shift in choreographic aesthetics known as postmodern dance. In the early 1960s, influenced by the composer John Cage, a group of young American choreographers began to invent new choreographic structures to frame the actions of everyday life. Through learning dances created in the 1960s and 70s, we will trace this evolving history. We will study the social and historical context in which the work emerged, specific challenges to the form, and the pervasive influence of these aesthetics in dance, performance, and visual art to this day. All levels of dance background are welcome. Admission is by permission of the instructor. This course is inclusive and open to all physical abilities; no prior experience in dance is required. HU

* **ART 3531b, Intermediate Painting** Maria De Los Angeles
Further exploration of concepts and techniques in painting, emphasizing the individuation of students' pictorial language. Various approaches to representational and abstract painting. Studio work is complemented by in-depth discussion of issues in historical and contemporary painting. Prerequisite: ART 1530, 2530, 2531, or permission of instructor. RP

ART 3532a, Painting Time Alexandria Smith
Painting techniques paired with conceptual ideas that explore how painting holds time both metaphorically and within the process of creating a work. Use of different Yale locations as subjects for observational on-site paintings. Prerequisite: ART 1530, 2530, or 2531, or with permission of instructor. HU RP

* **ART 3555a, Silkscreen Printing** Alexander Valentine
Presentation of a range of techniques in silkscreen and photo-silkscreen, from hand-cut stencils to prints using four-color separation. Students create individual projects in a workshop environment. Prerequisite: ART 1514 or equivalent. HU

ART 3556a, Printmaking I Hasabie Kidanu
An introductory course on the historical, material, and collaborative nature of printmaking. Through studio projects, lectures, and critiques, we will explore both a personal and technological understanding of the print medium. Where and how does it share a commonality with literature, sculpture, photography and the moving image? We will experiment with various techniques, including intaglio (dry-point etching, hard ground, aquatint), monotype, relief (linocut), and screen printing. Students will demonstrate critical thinking skills by engaging in a dialogue about their own work and the work of others. The themes of experimentation, reproducibility, storytelling, play, and patience will be particularly highlighted. Prerequisite: ART 1514 or equivalent. RP

* **ART 3558a, Introduction to Intaglio Printmaking** Hasabie Kidanu
This studio course introduces students to the foundations of intaglio printmaking including drypoint, line-etch, and aquatint along with plate preparation, printing, and registration. Intaglio, a 500-year old process offering a wide range of marks and tones, involves incising a surface to create a repeatable image matrix. Visiting artists, visits to Yale special collections, essays and lectures will supplement studio instruction. No previous printmaking experience necessary.

* **ART 3559b, Introduction to Lithography** Staff
This studio course introduces students to the foundations of Lithographic printmaking including stone, ball ground, and photographic plates, printing, and registration. Lithography, a planographic process developed in the 19th century, is particularly suited to reproducing drawn marks and high resolution photo prints. Visiting artists, visits to Yale special collections, essays and lectures supplement studio instruction. No previous printmaking experience necessary.

* **ART 3560b, Print Series** Hasabie Kidanu
The print series has been integral to printmaking since its earliest days, evolving alongside the medium. Through the making of a series we explore what is integral to the printmaking medium and the print shop: in-depth exploration/experimentation, patience, persistence, play, and editing. Students develop a cohesive print series that expresses both their personal and historical appreciation of the medium. Our first half of the semester is an overview of selected techniques–intaglio (dry-point, hard ground,

aquatint), relief (linocut, woodcut), stencil (screenprint) printing. The second half of the semester is dedicated to students developing their own projects. Students work independently with guidance from the instructor, culminating in a final portfolio and presentation. Prerequisite: ART 3558, ART 4557, ART 3556, or instructor approval.

ART 3649b, Advanced Video Installation Ben Hagari
This is an intensive project-based class exploring the production of video installations and the intersections of such mediums as performance, kinetic sculptures, video and sound. Students enhance their skills to create complex environments and sharpen their conceptual and logistical considerations when working with space and time. Prerequisite: ART 1622, prior experience in video or installation, or permission of instructor.

* **ART 3768b, Graphic Design Methodologies** Staff
Various ways that design functions; how visual communication takes form and is recognized by an audience. Core issues inherent in design: word and image, structure, and sequence. Analysis and refinement of an individual design methodology. Attention to systematic procedures, techniques, and modes of inquiry that lead to a particular result. Prerequisites: ART 1732 and 2764, or permission of instructor. RP

* **ART 3769a or b, Interactive Design and the Internet: Software for People** Staff
In this studio course, students create work within the web browser to explore where the internet comes from, where it is today, and where it's going—recognizing that there is no singular history, present, or future, but many happening in parallel. The course in particular focuses on the internet's impact on art—and vice versa—and how technological advance often coincides with artistic development. Students will learn foundational, front-end languages HTML, CSS, and JavaScript in order to develop unique graphic forms for the web that are considered alongside navigation, pacing, and adapting to variable screen sizes and devices. Open to Art majors. No prior programming experience required. Prerequisite: ART 1732 or permission of instructor. RP

ART 3770b, Motion Design: Communicating with Time, Motion, and Sound Staff
A studio class that explores how the graphic designer's conventions of print typography and the dynamics of word-image relationship change with the introduction of time, motion, and sound. Projects focus on the controlled interaction of words and images to express an idea or tell a story. The extra dimensions of time-based communications; choreography of aural and visual images through selection, editing, and juxtaposition. Prerequisite: ART 2765; ART 3768 recommended. RP

* **ART 3794a, Text, Speech, and Moving Image** Neil Goldberg
This studio course explores the formal and expressive possibilities of language—both as visual text and spoken word—within video art. Through in-class prompts, students generate writing in various styles, including diaristic, free-associative, expository, and lyrical. This writing serves as a catalyst for video material, which in turn informs new writing, cultivating an iterative dialectic between the two. Readings are drawn from experimental memoir, fiction, poetry, and hybrid forms; screenings include single-channel video art, video installation, and experimental cinema. Students engage in regular critiques as they develop a series of short video works, culminating in a final project. Prerequisites: ART 145 or permission of instructor.

* **ART 3839a, Narrative Forms and Documentary Style In Photography after 1967** John Pilson
Artistic approaches to photography, ranging from documentary to studio, and appropriation as they converge on the current "digital" moment. Lectures, readings, and assignments are designed to develop and challenge critical, historical, and visual thought while providing creative inspiration for individual projects. Prerequisites: ART 1836, ART 1838, or equivalent. RP

* **ART 3879b, Form For Content in Large Format** Benjamin Donaldson
A course for experienced photography students to become more deeply involved with the important technical and aesthetic aspects of the medium, including a concentrated study of operations and conceptual thinking required in the use of loaned analog view cameras, added lighting and advanced printing techniques. Scanning and archival printing of negatives are included. Student work is discussed in regular rigorous critiques. Review of significant historic photographic traditions is covered. Students are encouraged to employ any previous digital training although this class is black-and-white analog photography Prerequisite: ART 2837 or permission of instructor. RP

ART 3941b / FILM 3550b, Intermediate Film Writing and Directing Jonathan Andrews
In the first half of the term, students write three-scene short films and learn the tools and techniques of staging, lighting, and capturing and editing the dramatic scene. In the second half of the term, students work collaboratively to produce their films. Focus on using the tools of cinema to tell meaningful dramatic stories. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 2941. RP

ART 3942b / FILM 3560b, Intermediate Documentary Filmmaking A.L. Steiner
Students explore the storytelling potential of the film medium by making documentaries an art form. The class concentrates on finding and capturing intriguing, complex scenarios in the world and then adapting them to the film form. Questions of truth, objectivity, style, and the filmmaker's ethics are considered by using examples of students' work. Exercises in storytelling principles and screenings of a vast array of films mostly made by independent filmmakers from now to the beginning of the last century. Limited enrollment. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 1942 or 2941 HU RP

* **ART 3995a or b, Junior Seminar** Staff
Ongoing visual projects addressed in relation to historical and contemporary issues. Readings, slide presentations, critiques by School of Art faculty, and gallery and museum visits. Critiques address all four areas of study in the Art major. Prerequisite: at least four courses in Art. HU RP

* **ART 4171a and ART 4172b, Independent Projects** Alexandria Smith
Independent work that would not ordinarily be accomplished within existing courses, designed by the student in conjunction with a School of Art faculty member. A course proposal must be submitted on the appropriate form for approval by the director of undergraduate studies and the faculty adviser. Expectations of the course include regular meetings, end-of-term critiques, and a graded evaluation.

ART 4514a, Advanced Drawing Maria De Los Angeles
Further instruction in drawing related to all four disciplines taught in the Art major. Emphasis on the development of students' conceptual thinking in the context of the

physical reality of the drawing process. Class time is divided between studio work, group critiques, discussion of assigned readings, and visits to working artists' studios. Open to all students by permission of instructor. Art majors prioritized. RP

* **ART 4545b, Advanced Digital Drawing** Anahita Vossoughi
Examines digital processes as pathways to expand traditional practices such as drawing and painting. Through fluid transitions between digital and physical media, students investigate an array of approaches to producing artworks. Readings, discussions, and hands-on projects provide historical, critical, and practical perspectives on how digital tools intersect with material art practices. Group critiques foster collaborative insights and support individual exploration. This class is open to both undergraduate and graduate students. Prerequisite: ART 245, or equivalent; or with permission of instructor.

ART 4645a, Advanced Sculpture Studio Practice I Sandra Burns
Self-directed work in sculpture. Group discussion of student projects, with readings, slides, and videos that address current art practices. Regular individual and group critiques. Enrollment limited to 12. Prerequisite: ART 3645 or 3646 or equivalent, or permission of instructor. RP

* **ART 4648b, Sculpture and Questions of Definition** Staff
What is sculpture? In addition to the conventional definition of sculpture being concerned with volume and mass in space, it seems that artwork falling out of any other category falls into sculpture. This studio seminar explores, through the work of the students in the class, how the conventional categories of sculpture, painting, graphic design, and photography as represented within the structure of the School of Art function to generate meaning. How art is responsive to its context and questions of authorship, process, and vulnerability are explored. Class time is spent in an effort to articulate students' work vis-a-vis these questions. In order to facilitate this effort, and to supplement three projects, various reading materials are discussed, and the work of other artists is considered. Open to art majors and graduate students from all areas of study with permission.

ART 4768b, Advanced Graphic Design: Ad Hoc Series and Systems Julian Bittiner
Much of the field of design concerns itself with devising systems in an attempt to create aesthetic coherence and reduce creative uncertainties, seeking efficiencies with respect to time, production and materials. However this strategy always comes up against each individual set of circumstances; the materials and content at hand, a particular cast of collaborators, a given timeframe. There is an element of the ad hoc in every piece of design; a need to improvise, interpret, adapt, make exceptions. A second thematic concern of this class is the exploration of medium-specificity and medium-porosity as they relate to such systems. The course is comprised of a series of interconnected prompts across distinct formats in print, motion, and interactive, at a wide variety of scales. A third and final thread is the cultivation of greater awareness of the evolving social and aesthetic functions of design processes, artifacts, and channels of engagement and distribution, within increasingly complex cultural contexts. Prerequisites: ART 2764 or 2765, and 3767 or 3768, or permission of instructor. RP

* **ART 4803b, Picture Collection** Sam Contis
Since the invention of photography, artists have used picture collections as tools for reference and inspiration. Contemporary artists increasingly use such collections

in ways that are foundational for their artistic practice. This course looks at artists' use of picture collections to critique culture and society and to raise questions about subjectivity, value, and desire. Through site visits, artist lectures, research presentations, and class discussions, students consider how picture collections take shape and often come to be inadvertent recorders of our times. Students explore how these collections can serve as resources for their own artistic practice, with the aim of developing original work presented in critiques throughout the semester. Prerequisite: Permission of instructor.

* **ART 4942a and ART 4943b / FILM 4830a and FILM 4840b, Advanced Film Writing and Directing** Jonathan Andrews
A yearlong workshop designed primarily for majors in Art and in Film & Media Studies making senior projects. Each student writes and directs a short fiction film. The first term focuses on the screenplay, production schedule, storyboards, casting, budget, and locations. In the second term students rehearse, shoot, edit, and screen the film. Priority to majors in Art and in Film & Media Studies. Prerequisite: ART 3941.

* **ART 4995a, Senior Project I** Alexandria Smith
A project of creative work formulated and executed by the student under the supervision of an adviser designated in accordance with the direction of the student's interest. Proposals for senior projects are submitted on the appropriate form to the School of Art Undergraduate Studies Committee (USC) for review and approval at the end of the term preceding the last resident term. Projects are reviewed and graded by an interdisciplinary faculty committee made up of members of the School of Art faculty. An exhibition of selected work done in the project is expected of each student. RP

* **ART 4996b, Senior Project II** Alexandria Smith
A project of creative work formulated and executed by the student under the supervision of an adviser designated in accordance with the direction of the student's interest. Proposals for senior projects are submitted on the appropriate form to the School of Art Undergraduate Studies Committee (USC) for review and approval at the end of the term preceding the last resident term. Projects are reviewed and graded by an interdisciplinary faculty committee made up of members of the School of Art faculty. An exhibition of selected work done in the project is expected of each student.

Astronomy (ASTR)

* **ASTR 0300b, Search for Extraterrestrial Life** Michael Faison
Introduction to the search for extraterrestrial life. Review of current knowledge on the origins and evolution of life on Earth; applications to the search for life elsewhere in the universe. Discussion of what makes a planet habitable, how common these worlds are in the universe, and how we might search for them. Survey of past, current, and future searches for extraterrestrial intelligence. Enrollment limited to first-year students. WR, SC

* **ASTR 0400a / PHYS 0400a, Expanding Ideas of Time and Space** Meg Urry
Discussions on astronomy, and the nature of time and space. Topics include the shape and contents of the universe, special and general relativity, dark and light matter, and dark energy. Observations and ideas fundamental to astronomers' current model of an expanding and accelerating four-dimensional universe. Enrollment limited to first-year students. SC

ASTR 1100a, Planets and Stars Michael Faison
Astronomy introduction to stars and planetary systems. Topics include the solar system and extrasolar planets, planet and stellar formation, and the evolution of stars from birth to death. No prerequisite other than a working knowledge of elementary algebra. QR, SC

ASTR 1200b, Galaxies and the Universe Hector Arce
An introduction to stars and stellar evolution; the structure and evolution of the Milky Way galaxy and other galaxies; quasars, active galactic nuclei, and supermassive black holes; cosmology and the expanding universe. No prerequisite other than a working knowledge of elementary algebra. QR, SC

ASTR 1550a, Introduction to Astronomical Observing Michael Faison
A hands-on introduction to techniques used in astronomy to observe astronomical objects. Observations of planets, stars, and galaxies using on-campus facilities and remote observing with Yale's research telescopes. Use of electronic detectors and computer-aided data processing. Evening laboratory hours required. One previous college-level science laboratory or astronomy course recommended. SC ½ Course cr

ASTR 1700b, Introduction to Cosmology Priyamvada Natarajan
An introduction to modern cosmological theories and observational astronomy. Topics include aspects of special and general relativity; curved space-time; the Big Bang; inflation; primordial element synthesis; the cosmic microwave background; the formation of galaxies; and large-scale structure. Prerequisite: a strong background in high school mathematics and physics. QR, SC

ASTR 1800a, Introduction to Relativity and Black Holes Charles Bailyn
Introduction to the theories of special and general relativity, and to relativistic astronomy and astrophysics. Topics include time dilation and length contraction; mass-energy equivalence; space-time curvature; black holes; wormholes; pulsars; quasars; gravitational waves; Hawking radiation. For students not majoring in the physical sciences; some previous acquaintance with high-school physics and/or calculus may be helpful, but is not required. QR, SC

ASTR 2100a, Stars and Their Evolution Hector Arce
Foundations of astronomy and astrophysics, focusing on an intensive introduction to stars. Nuclear processes and element production, stellar evolution, stellar deaths and supernova explosions, and stellar remnants including white dwarfs, neutron stars, and black holes. A close look at our nearest star, the sun. How extrasolar planets are studied; the results of such studies. Prerequisite: a strong background in high school calculus and physics. May not be taken after ASTR 220. QR, SC 0 Course cr

ASTR 2550a / PHYS 3950a, Research Methods in Astrophysics Marla Geha
An introduction to research methods in astronomy and astrophysics. The acquisition and analysis of astrophysical data, including the design and use of ground- and space-based telescopes, computational manipulation of digitized images and spectra, and confrontation of data with theoretical models. Examples taken from current research at Yale and elsewhere. Use of the Python programming language. Prerequisite: background in high school calculus and physics. No previous programming experience required. QR, SC RP

ASTR 3100b, Galactic and Extragalactic Astronomy Jeffrey Kenney
Structure of the Milky Way galaxy and other galaxies; stellar populations and star clusters in galaxies; gas and star formation in galaxies; the evolution of galaxies; galaxies and their large-scale environment; galaxy mergers and interactions; supermassive black holes and active galactic nuclei. Prerequisites: MATH 115, PHYS 201, and ASTR 210 or 220, or equivalents, or with permission of instructor. QR, SC

ASTR 3200b, Physical Processes in Astronomy Frank van den Bosch
Introduction to the physics required for understanding current astronomical problems. Topics include basic equations of stellar structure, stellar and cosmic nucleosynthesis, radiative transfer, gas dynamics, and stellar dynamics. Numerical methods for solving these equations. Prerequisites: MATH 120 and PHYS 201 or equivalents, or permission of instructor. Previous experience with computer programming recommended. Taught in alternate years. QR, SC

ASTR 3550a, Observational Astronomy Pieter van Dokkum
Optics for astronomers. Design and use of optical telescopes, photometers, spectrographs, and detectors for astronomical observations. Introduction to error analysis, concepts of signal-to-noise, and the reduction and analysis of photometric and spectroscopic observations. Prerequisite: One astronomy course numbered above 200. This course should be taken concurrently with ASTR 330, and/or after successfully completing ASTR 255. QR, SC

* **ASTR 3560a / ASTR 5560a / PHYS 3560a, Astrostatistics and Data Mining** Earl Bellinger
This course is intended to give students majoring in astronomy, physics, or any other physical science the necessary background to be able to conduct research with large and complex datasets. The course provides an introduction to the tools needed for analyzing large volumes of data and gives students more experience in building codes to analyze to them. The course starts with a review of basic probability and statistics. Students then learn the basics of classical statistical inference, regression and model fitting, Bayesian statistical inference, as well as different data-mining techniques. Coding with the Python programming language. Prerequisite: ASTR 255 or equivalent. QR, SC

ASTR 3800b, Stellar Populations Robert Zinn
The stellar populations of our galaxy and galaxies of the Local Group. Topics include the properties of stars and star clusters, stellar evolution, and the structure and evolution of our galaxy. Prerequisites: PHYS 201 and MATH 120, and one astronomy course numbered above 200. Taught in alternate years. QR, SC

ASTR 4000b / MENG 4343 / MENG TBD-4, Orbital Mechanics and Mission Design Marla Geha
Introduction to spacecraft orbital mechanics, astrodynamics, and the design and implementation of spaceflight maneuvers for Earth-orbiting satellites and interplanetary probes. The class first addresses how to describe and predict the motion of a spacecraft in orbit around the Earth, how to change orbits, lunar and interplanetary trajectories, and how satellites are launched into orbit from Earth. The class then focuses on the space environment and considerations for spacecraft design. Prerequisites: PHYS 170/171, or 180/181, or 200/201, or 260/261. Concurrently with MATH 246, PHYS 301 or other advanced mathematics course. ASTR 255, PHYS 378 or other experience with python coding is recommended. QR, SC

ASTR 4200a, Computational Methods for Astrophysics Paolo Coppi
The analytic, numerical, and computational tools necessary for effective research in astrophysics and related disciplines. Topics include numerical solutions to differential equations, spectral methods, and Monte Carlo simulations. Applications to common astrophysical problems including fluids and N-body simulations. Prerequisites: ASTR 320, MATH 120, 222 or 225, and 246. QR

* **ASTR 4710a and ASTR 4720b, Independent Project in Astronomy** Marla Geha
Independent project supervised by a member of the department with whom the student meets regularly. The project must be approved by the instructor and by the director of undergraduate studies; the student is required to submit a complete written report on the project at the end of the term.

* **ASTR 4900a and ASTR 4910b, The Two-Term Senior Project** Marla Geha
A two-term independent research project to fulfill the senior requirement for the B.S. degree. The project must be supervised by a member of the department and approved by the director of undergraduate studies.

* **ASTR 4920a or b, The One-Term Senior Project** Marla Geha
A one-term independent research project or essay to fulfill the senior requirement for the B.A. degree. The project must be supervised by a member of the department and approved by the director of undergraduate studies.

Biology (BIOL)

BIOL 1010a or b, Biochemistry and Biophysics Staff
The study of life at the molecular level. Topics include the three-dimensional structures and function of large biological molecules, the human genome, and the design of antiviral drugs to treat HIV/AIDS. The first of four modules in a yearlong foundational biology sequence; meets for the first half of the term. If you are taking this class along with BIOL 102, you should register for the same discussion section in BOTH classes. For instance, if you are in BIOL 102 A, then you should register for BIOL 101 A as well SC 0 Course cr

BIOL 1020a or b, Principles of Cell Biology Staff
The study of cell biology and membrane physiology. Topics include organization and functional properties of biological membranes, membrane physiology and signaling, rough endoplasmic reticulum and synthesis of membrane/secretory membrane proteins, endocytosis, the cytoskeleton, and cell division. The second of four modules in a yearlong foundational biology sequence; meets for the second half of the term. Prerequisite: BIOL 101. If you are taking this class along with BIOL 101, you should register for the same discussion section in BOTH classes. For instance, if you are in BIOL 101 A, then you should register for BIOL 102 A as well. SC 0 Course cr

* **BIOL 1030a or b, Genetics and Development** Staff
Foundation principles for the study of genetics and developmental biology. How genes control development and disease; Mendel's rules; examples of organ physiology. The third of four modules in a yearlong foundational biology sequence; meets for the first half of the term. Prerequisites: BIOL 101 and 102. If you are taking this class along with BIOL 104, you should register for the same discussion section in BOTH classes. For

instance, if you are in BIOL 103 A, then you should register for BIOL 104 A as well. SC 0 Course cr

BIOL 1040a or b, Principles of Ecology and Evolutionary Biology Staff
The study of evolutionary biology, animal behavior, and the history of life. Evolutionary transitions and natural selection. Adaptation at genic, chromosomal, cellular, organismal, and supra-organismal levels. Distributional and social consequences of particular suites of organismal adaptations. If you are taking this class along with BIOL 103, you should register for the same discussion section in BOTH classes. For instance, if you are in BIOL 103 A, then you should register for BIOL 104 A as well. The fourth of four modules in a yearlong foundational biology sequence; meets for the second half of the term. Prerequisites: BIOL 101, 102, and 103. SC 0 Course cr

Biomedical Engineering (BENG)

* **BENG 2048a / SOCY 2048a, AI, Medicine, and Society** Alka Menon and Xenophon Papademetris
AI has shown tremendous promise to address problems in medicine and science. There is also considerable hype surrounding AI and many concerns (some justified, some not) regarding the use of this type of technology. This discussion-based seminar will 1) provide undergraduate students across disciplines with a broad overview of issues related to AI in medicine at a non-technical level, drawing on perspectives from the interpretive/humanistic social sciences, computing, engineering, and healthcare and 2) model interdisciplinary communication and build a robust framework for collaboration. Overarching topics, grounded in medical case studies, include what it means for computers to "think" and how we understand what they are thinking about; the use and limits of scientific knowledge in making policy decisions; bias, fairness, equity, equality; the challenges of implementation of AI systems; safety and risk; and the human/computer interface. The course also provides a high level overview of machine learning, discussing opportunities, limitations, and tradeoffs. Ultimately, the course offers a grounded look at how AI is being discussed and deployed on the ground in medicine, equipping students with a critical lens for thinking about responsible and practical implementation and innovation when it comes to AI. SO

* **BENG 2080a, Sophomore Seminar in Biomedical Engineering** Staff
Study of past successes and future needs of the multidisciplinary field of biomedical engineering. Areas of focus include: biomolecular engineering, including drug delivery and regenerative medicine; biomechanics, including mechanobiology and multiscale modeling; biomedical imaging and sensing, including image construction and analysis; and systems biology. ½ Course cr

* **BENG 2105a, Discovery and Design in Biomedical Research** Jay Humphrey
Multi-disciplinary and team-based research approach to the study of clinical dilemma. Focus on an important health care problem, bringing to bear concepts and principles from diverse areas to identify possible solutions. Study of precision regenerative medicine as it involves aspects of bioengineering, materials science, immunobiology, mechanobiology, computational modeling, and experimental design, as well as hands-on fabrication and materials testing (i.e., data collection and analysis). Prerequisites: MATH 115 and MATH 120 or ENAS 151. SC

BENG 2800b, Introduction to Biomedical Computation Staff
The course focuses on the introduction to the computational tools and methods needed for the simulation and analysis of biological and medical systems and data. Programming in Python is the major tool to achieve these goals, and provides the basic knowledge needed for higher- level Biomedical Engineering classes. The course also provides the basics of probability and statistics. Computational applications in Biomedical Engineering complete the course. Prerequisite: MATH 120 or ENAS 151. QR 0 Course cr

* **BENG 3100a, Physiological Systems Laboratory** Staff
Introduction to laboratory techniques and tools used in biomedical engineering for physiological measurement. Topics include bioelectric measurement, signal processing, and bone mechanics. Enrollment limited to majors in Biomedical Engineering, except by permission of the director of undergraduate studies. SC 0 Course cr

* **BENG 3110b, Biomedical Engineering Laboratory** Staff
Continuation of BENG 355L, introducing laboratory techniques and tools used in biomedical engineering. Topics include biomaterials and cell interactions, magnetic resonance spectroscopy and imaging, and image processing and machine learning. Enrollment limited. SC 0 Course cr

* **BENG 3200a / MCDB 3100a, Physiological Systems** Staff
Regulation and control in biological systems, emphasizing human physiology and principles of feedback. Biomechanical properties of tissues emphasizing the structural basis of physiological control. Conversion of chemical energy into work in light of metabolic control and temperature regulation. Prerequisites: CHEM 165 or 167 (or CHEM 113 or 115), or PHYS 180 and 181; MCDB 120, or BIOL 101 and 102. SC 0 Course cr

BENG 3230a / MB&B 3300a and MB&B 3310a / MB&B 3310a / MCDB 3310a / NSCI 3240a, Modeling Biological Systems I Thierry Emonet and Kathryn Miller-Jensen
Biological systems make sophisticated decisions at many levels. This course explores the molecular and computational underpinnings of how these decisions are made, with a focus on modeling static and dynamic processes in example biological systems. This course is aimed at biology students and teaches the analytic and computational methods needed to model genetic networks and protein signaling pathways. Students present and discuss original papers in class. They learn to model using MatLab in a series of in-class hackathons that illustrate the biological examples discussed in the lectures. Biological systems and processes that are modeled include: (i) gene expression, including the kinetics of RNA and protein synthesis and degradation; (ii) activators and repressors; (iii) the lysogeny/lysis switch of lambda phage; (iv) network motifs and how they shape response dynamics; (v) cell signaling, MAP kinase networks and cell fate decisions; and (vi) noise in gene expression. Prerequisites: MATH 115 or 116. BIOL 101-104, or with permission of instructors. This course also benefits students who have taken more advanced biology courses (e.g. MCDB 200, MCDB 310, MB&B 300/301). QR, SC 0 Course cr

BENG 3400b, Biomedical Signals and Images Lawrence Staib and James Duncan
Principles and methods used to represent, model, and process signals and images arising from biomedical sources. Topics include continuous and discrete linear systems

analysis, Fourier analysis and frequency response, metrics for signal similarity, and noise filtering. Biomedical examples range from one-dimensional electrical signals in nerves and muscles to two-dimensional images of organs and cells. Prerequisite: MATH 120 or ENAS 151. BENG 249, 350, and ENAS 194 strongly recommended. QR

BENG 3500a / PHYS 3530a, Introduction to Biomechanics Michael Murrell
An introduction to the biomechanics used in biosolid mechanics, biofluid mechanics, biothermomechanics, and biochemomechanics. Diverse aspects of biomedical engineering, from basic mechanobiology to the design of novel biomaterials, medical devices, and surgical interventions. Prerequisites: PHYS 180, PHYS 181, MATH 115, and ENAS 194. QR 0 Course cr

BENG 3600b / CENG 351, Biotransport and Kinetics Kathryn Miller-Jensen
Creation and critical analysis of models of biological transport and reaction processes. Topics include mass and heat transport, biochemical interactions and reactions, and thermodynamics. Examples from diverse applications, including drug delivery, biomedical imaging, and tissue engineering. Prerequisites: MATH 115, ENAS 194; BIOL 101 and 102; CHEM 161, 163, or 167; BENG 249. QR 0 Course cr

* **BENG 4063b / ECON 4463b, The Economics and Science of Medicine** Gregory Raskin and Yashodhara Dash
This multidisciplinary class is an exploration of the background of today's bestselling medicines, their huge commercial impact, and the companies that created them. It focuses on the most compelling aspects of drug development and company formation in the context of topical issues like cancer treatment, gene editing, stem cell therapy, the opioid epidemic, and drug pricing controversies. Prerequisite: Introductory or intermediate microeconomics, introductory or intermediate Biology, Molecular Biology, Chemistry or Biomedical Engineering. SO

* **BENG 4080a, Seminar in Biomedical Engineering** Staff
Oral presentations and written reports by students analyzing papers from scientific journals on topics of interest in biomedical engineering, including discussions and advanced seminars from faculty on selected subjects. (For Class of 2020 and beyond this course is worth .5 credit.) ½ Course cr

BENG 4104b / MENG 4154b, Medical Device Design and Innovation Daniel Wiznia and Steven Tommasini
The engineering design, project planning, prototype creation, and fabrication processes for medical devices that improve patient conditions, experiences, and outcomes. Students develop viable solutions and professional-level working prototypes to address clinical needs identified by practicing physicians. Some attention to topics such as intellectual property, the history of medical devices, documentation and reporting, and regulatory affairs. 0 Course cr

* **BENG 4106b, Medical Software Design** Xenophon Papademetris
Software design and implementation for medical applications, with emphasis on how new ideas can be developed within today's healthcare regulatory environment. This is a project-based class. The lectures provide essential material to help the students successfully complete their projects. In particular, the lectures cover material in the following three broad areas: (i) Medical software design based on a clinical need. (ii) Needs identification, verification, validation, and overview of the FDA regulatory process. (iii) Introductory material in experimental design, image analysis, and

machine learning as needed by the projects. We also examine the new proposed FDA regulations on the use of machine learning in medical devices and related issues related to the use of these techniques in medical software in general. Prerequisite: Some programming background in at least one programming language. Instructor permission required.

* **BENG 435o0b, Biomaterial-Tissue Interactions** Themis Kyriakides
Study of the interactions between tissues and biomaterials, with an emphasis on the importance of molecular- and cellular-level events in dictating the performance and longevity of clinically relevant devices. Attention to specific areas such as biomaterials for tissue engineering and the importance of stem/progenitor cells, as well as biomaterial-mediated gene and drug delivery. Prerequisites: CHEM 161, 165, or 167 (or CHEM 112, 114, or 118); MCDB 120, or BIOL 101 and 102; or equivalents. SC

* **BENG 4410a, Physical and Chemical Basis of Bioimaging and Biosensing** Douglas Rothman and Daniel Coman
Basic principles and technologies for sensing the chemical, electrical, and structural properties of living tissues and of biological macromolecules. Topics include magnetic resonance spectroscopy, microelectrodes, fluorescent probes, chip-based biosensors, X-ray and electron tomography, and MRI. Prerequisites: BENG 351 and 352 or permission of instructor. QR, SC

* **BENG 4411a / ENAS 415, Practical Applications of Bioimaging and Biosensing** Daniel Coman and Evelyn Lake
Detecting, measuring, and quantifying the structural and functional properties of tissue is of critical importance in both biomedical research and medicine. This course focuses on the practicalities of generating quantitative results from raw bioimaging and biosensing data to complement other courses focus on the theoretical foundations which enable the collection of these data. Participants in the course work with real, cutting-edge data collected here at Yale. They become familiar with an array of current software tools, denoising and processing techniques, and quantitative analysis methods that are used in the pursuit of extracting meaningful information from imaging data. The subject matter of this course ranges from bioenergetics, metabolic pathways, molecular processes, brain receptor kinetics, protein expression and interactions to wide spread functional networks, long-range connectivity, and organ-level brain organization. The course provides a unique hands-on experience with processing and analyzing *in vitro* and *in vivo* bioimaging and biosensing data that is relevant to current research topics. The specific imaging modes which are covered include *in vivo* magnetic resonance spectroscopy (MRS) and spectroscopic imaging (MRSI), functional, structural, and molecular imaging (MRI), wide-field fluorescent optical imaging, and positron emission tomography (PET). The course provides the necessary background in biochemistry, bioenergetics, and biophysics for students to motivate the image manipulations which they learn to perform. Prerequisites: Math through first order differential equations, PHYS 180/181, CHEM 161, BIOL 101/102, BENG 249 or other experience with scientific software like MATLAB®, BENG 350 and BENG 410 (both of which can be taken at the same time as this course) SC o Course cr

BENG 4420a, Biophotonics Cristina Rodriguez
This course provides an introduction to biophotonics, with a strong emphasis on optical microscopy and the fundamental principles governing how light interacts with biological matter. Students learn key optical concepts, including diffraction,

interference, Fourier optics, and fluorescence, as well as advanced techniques such as multiphoton microscopy and harmonic generation imaging. The course covers the physics underlying imaging systems, the design and function of modern optical microscopes, and their applications in biomedical research. This course is designed for students in biomedical engineering, physics, biology, and related fields who seek to understand the optical foundations of modern imaging technologies. Prerequisites: MATH 120 or ENAS 151, PHYS 180. SC

BENG 4440a, Modern Medical Imaging: Lecture and Demonstrations Chi Liu, Dana Peters, and Gigi Galiana

Survey of engineering and physics foundations of modern medical imaging modalities with an emphasis on immersive and interactive experiences. Traditional lectures are balanced with guest lectures on state-of-the-art techniques and opportunities to observe procedures, acquire imaging data and reconstruct images. Modalities include MRI, X-ray, CT, SPECT, PET, optical and ultrasound methods. Prerequisite: BENG 352 or similar background. QR, SC

BENG 4450a / EENG 445, Biomedical Image Processing and Analysis Lawrence Staib and James Duncan

This course is an introduction to biomedical image processing and analysis, covering image processing basics and techniques for image enhancement, feature extraction, compression, segmentation, registration and motion analysis including traditional and machine learning techniques. Student learn the fundamentals behind image processing and analysis methods and algorithms with an emphasis on biomedical applications. Prerequisite: BENG 352 or EENG 310 or permission of instructors. Recommended preparation: familiarity with probability theory.

BENG 4475a / CPSC 4750a / ECE 4750, Computational Vision and Biological Perception Steven Zucker

An overview of computational vision with a biological emphasis. Suitable as an introduction to biological perception for computer science and engineering students, as well as an introduction to computational vision for mathematics, psychology, and physiology students. Prerequisite: CPSC 112 and MATH 120, or with permission of instructor. QR, SC RP

* **BENG 4485b, Fundamentals of Neuroimaging** Fahmeed Hyder, Elizabeth Goldfarb, and Douglas Rothman

The neuroenergetic and neurochemical basis of several dominant neuroimaging methods, including fMRI. Technical aspects of different methods, interpretation of results, and controversies or challenges regarding the application of fMRI and related methods in medicine. WR, SC

BENG 4550b, Vascular Mechanics Jay Humphrey

Methods of continuum biomechanics used to study diverse vascular conditions and treatments from an engineering perspective. Topics include hypertension, atherosclerosis, aneurysms, vein grafts, and tissue engineered constructs. Emphasis on mechanics driven by advances in vascular mechanobiology. Prerequisite: BENG 353. QR

* **BENG 4560b, Molecular and Cellular Biomechanics** Michael Murrell

The basic mechanical principles at the molecular and cellular level that underlie the major physical behaviors of the cell, from cell division to cell migration. Basic

cellular physiology, methodology for studying cell mechanical behaviors, models for understanding the cellular response under mechanical stimulation, and the mechanical impact on cell differentiation and proliferation. Prerequisites: MENG 211 and 280 or equivalents, and experience with MATLAB. Recommended preparation: BENG 353 and MCDB 205. QR, SC

BENG 4570b / MENG 4370b, Computational Mechanics Martin Pfaller
This course integrates fundamental concepts from nonlinear continuum mechanics and finite element methods applied to solid and fluid mechanics, focusing on theoretical understanding and numerical techniques. Topics covered are fundamentals of tensor calculus, kinematics, balance equations, constitutive relationships, geometric and material nonlinearities, nonlinear solution strategies, stability, nonlinear dynamics, errors, convergence, and adaptivity. Applications in biomedical engineering are stressed throughout the course. Fundamentals in calculus, differential equations, and linear algebra.

BENG 4611b, BioMEMS and Biomedical Microdevices Rong Fan
Principles and applications of micro- and nanotechnologies for biomedicine. Approaches to fabricating micro- and nanostructures. Fluid mechanics, electrokinetics, and molecular transport in microfluidic systems. Integrated biosensors and microTAS for laboratory medicine and point-of-care uses. High-content technologies, including DNA, protein microarrays, and cell-based assays for differential diagnosis and disease stratification. Emerging nanobiotechnology for systems medicine. Prerequisites: CHEM 161, 165, or 167 (or CHEM 112, 114, or 118), and ENAS 194. SC

BENG 4630a, Immunoengineering Tarek Fahmy
Immuno-engineering uses engineering and applied sciences to better understand how the immune system works. It also uses immunity to build better models and biomaterials that help fight diseases such as cancer, diabetes, lupus, MS, etc. This is an integrative class. It integrates what we know in ENAS with what we know in Immunity to address critical and urgent concerns in health and disease. Students learn that analytical tools and reagents built by engineers address some extremely significant problems in immunity, such as optimal vaccine design. Students also have the opportunity to apply new understandings towards gaping holes in immunotherapy and immunodiagnostics. Prerequisite: A basic understanding of biochemistry, biophysics, cell biology; calculus and differential equations. QR, SC

BENG 4680b, Topics in ImmunoEngineering Tarek Fahmy
This course addresses the intersection of Immunobiology with Engineering and Biophysics. It invokes engineering tools, such as biomaterials, solid-state devices, nanotechnology, biophysical chemistry, and chemical engineering towards developing newer and effective solutions to cancer immunotherapy, autoimmune therapy, vaccine design, transplantation, allergy, asthma, and infections. The central theme is that dysfunctional immunity is responsible for a wide range of disease states and that engineering tools and methods can forge a link between the basic science and clinically translatable solutions that will potentially be "modern cures" to disease. This course is a follow-up to BENG 463, Immunoengineering and focuses more on the clinical translation aspect as well as new understandings in immunology and how they can be translated to the clinic and eventually to the market. Prerequisites: BENG 463, Differential Equations, Advanced Calculus. SC

BENG 4690a, Single-Cell Biology, Technologies, and Analysis Rong Fan
This course is to teach the principles of single-cell heterogeneity in human health and disease as well as computational techniques for single-cell analysis, with a particular focus on the omics-level data. Topics to be covered include single-cell level morphometric analysis, genomic alteration analysis, epigenomic analysis, mRNA transcriptome sequencing, small RNA profiling, surface epitope, intracellular signaling protein, and secreted protein analysis, metabolomics, multi-omics, and spatially resolved single-cell omics mapping. The students are expected to perform computational analysis of single-cell high-dimensional datasets to identify population heterogeneity, identify cell types, states, and differentiation trajectories. Finally, case studies are provided to show the power of single-cell analysis in therapeutic target discovery, biomarker research, clinical diagnostics, and personalized medicine. Lab tours may be provided to show how single-cell omics data are generated and how high-throughput sequencing is conducted. SC

* **BENG 4724b / MENG 4774b, Topics in Computational and Systems Biology** Purushottam Dixit
This course covers topics related to modeling biological networks across time and length scales. Specifically, the course covers models of intracellular signaling networks, transcriptional regulation networks, cellular metabolic networks, and ecological networks in microbial consortia. For each type of network, we cover the biological basics, standard mathematical treatments including deterministic and stochastic modeling, methods to infer model parameters from data, and new machine-learning based inference approaches. The required mathematical methods are briefly covered. The course assignments involve coding in MATLAB. Prerequisite: MATH 120 or ENAS 151.

BENG 4767b, Systems Biology of Cell Signaling Andre Levchenko
Approaches from systems biology to the fundamental processes underlying both the sensory capability of individual cells and cell-to-cell communication in health and disease. Prerequisites: BENG 249 and ENAS 194, or equivalents. QR, SC

* **BENG 4825a, Neuro-AI** Shreya Saxena
The design and implementation of methods to model static and dynamical neural data, including dimensionality reduction as well as encoding and decoding models. The history, design, and importance of neuroscience-inspired artificial intelligence. Prerequisite: MATH 120 or ENAS 151 QR, SC

BENG 4849b, Biomedical Data Analysis Cristina Rodriguez and Richard Carson
Study of biological and medical data analysis associated with applications of biomedical engineering. Provides basics of probability and statistics, as well as analytical approaches for determination of quantitative biological parameters from experimental data. Includes substantial programming in MATLAB. Prerequisite: MATH 120 or ENAS 151. After or concurrently with ENAS 194. QR 0 Course cr

* **BENG 4910b, Effective Fellowship Grant Writing: From Concept to Submission** Fadi Akar
This course is designed to equip participants with the essential skills and strategies needed to prepare successful fellowship grant applications. It covers the entire grant writing process, from understanding funding opportunities and requirements to developing a compelling proposal. Participants learn how to clearly define research

goals, align their projects with funding criteria, and craft persuasive narratives that effectively communicate their ideas. The course also emphasizes the importance of strong supporting documents, including CVs, budgets, and letters of recommendation. Through practical exercises, peer reviews, and expert feedback, participants refine their writing techniques, enhance proposal clarity, and increase their chances of securing funding. Course intended for Seniors and Graduate Students in Biomedical Engineering or a related Biomedical Sciences department. WR

*** BENG 4971a and BENG 4972b, Special Projects** Lawrence Staib
Faculty-supervised individual or small-group projects with emphasis on research (laboratory or theory), engineering design, or tutorial study. Students are expected to consult the director of undergraduate studies and appropriate faculty members about ideas and suggestions for suitable topics. This course, offered Pass/Fail, can be taken at any time during a student's career, and may be taken more than once. For the Senior Project, see BENG 473, 474. Permission of both the instructor and the director of undergraduate studies is required.

*** BENG 4973a and BENG 4974b, Senior Project** Lawrence Staib
Faculty-supervised biomedical engineering projects focused on research (laboratory or theory) or engineering design. Students should consult with the director of undergraduate studies and appropriate faculty mentors for suitable projects. BENG 473 is taken during the fall term of the senior year and BENG 474 is taken during the spring term of the senior year. Permission of both the faculty mentor and the director of undergraduate studies is required.

Bosnian-Serbian-Croatian (SBCR)

SBCR 1100a, Elementary Bosnian-Croatian-Serbian I Staff
The first half of a two-term introduction to Bosnian-Croatian-Serbian designed to develop skills in comprehension, reading, speaking, and writing. The grammatical structure and the writing systems of the languages; communication on topics drawn from daily life. Study of Serbian, Bosnian, and Croatian culture, and of south Slavic culture more generally. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L1 RP 1½ Course cr

*** SBCR 1200b, Elementary Bosnian-Croatian-Serbian II** Staff
The second half of a two-term introduction to Bosnian-Croatian-Serbian designed to develop skills in comprehension, reading, speaking, and writing. The grammatical structure and the writing systems of the languages; communication on topics drawn from daily life. Study of Serbian, Bosnian, and Croatian culture, and of south Slavic culture more generally. Prerequisite: SBCR 110 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L2 RP 1½ Course cr

SBCR 1300a, Intermediate Bosnian Croatian Serbian I Staff
This intermediate course is a continuation of the elementary course and is intended to enhance overall communicative competence in the language. This course moves forward from the study of the fundamental systems and vocabulary of the Bosnian/

Croatian/Serbian to rich exposure to the spoken and written language with the wide range of speakers and situations. SBCR 120, or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L3 RP 1½ Course cr

SBCR 1400b, Intermediate Bosnian Croatian Serbian II Staff
The intermediate course in BCS is a continuation of the elementary course and is intended to enhance overall communicative competence in the language. This course moves forward from the study of the fundamental systems and vocabulary of the Bosnian/Croatian/Serbian to rich exposure to the spoken and written language with the wide range of speakers and situations. Prerequisite: SBCR 130 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L4 RP 1½ Course cr

British Studies (BRST)

Burmese (BURM)

Chemical Engineering (CENG)

*** CENG 1200a / ENAS 1200a / ENVE 1200a, Introduction to Environmental Engineering** Colby Buehler
Introduction to engineering principles related to the environment, with emphasis on causes of problems and technologies for abatement. Topics include air and water pollution, global climate change, hazardous chemical and emerging environmental technologies. Prerequisites: high school calculus and chemistry or CHEM 161, 165 or CHEM 163, 167 (may be taken concurrently) or permission of instructor. QR, SC

CENG 2100a / ENVE 2100, Principles of Chemical Engineering and Process Modeling Peijun Guo
Analysis of the transport and reactions of chemical species as applied to problems in chemical, biochemical, and environmental systems. Emphasis on the interpretation of laboratory experiments, mathematical modeling, and dimensional analysis. Lectures include classroom demonstrations. Prerequisite: MATH 115 or permission of instructor. QR, SC RP 0 Course cr

CENG 3010b, Chemical Kinetics and Chemical Reactors Shu Hu
Physical-chemical principles and mathematical modeling of chemical reactors. Topics include homogeneous and heterogeneous reaction kinetics, catalytic reactions, systems of coupled reactions, selectivity and yield, chemical reactions with coupled mass transport, nonisothermal systems, and reactor design. Applications from problems in environmental, biomedical, and materials engineering. Prerequisite: ENAS 194 or permission of instructor. QR, SC

CENG 3140a / ENVE 3140a, Transport Phenomena I Kyle Vanderlick
First of a two-semester sequence. Unified treatment of momentum, energy, and chemical species transport including conservation laws, flux relations, and boundary conditions. Topics include convective and diffusive transport, transport with homogeneous and heterogeneous chemical reactions and/or phase change, and

interfacial transport phenomena. Emphasis on problem analysis and mathematical modeling, including problem formulation, scaling arguments, analytical methods, approximation techniques, and numerical solutions. Prerequisite: ENAS 194 or permission of the instructor. QR, SC RP

CENG 3150b / ENVE 3150b, Transport Phenomena II Michael Loewenberg
Unified treatment of momentum, energy, and chemical species transport including conservation laws, flux relations, and boundary conditions. Topics include convective and diffusive transport, transport with homogeneous and heterogeneous chemical reactions and/or phase change, and interfacial transport phenomena. Emphasis on problem analysis and mathematical modeling, including problem formulation, scaling arguments, analytical methods, approximation techniques, and numerical solutions. Prerequisite: ENAS 194 or permission of instructor. QR, SC

* **CENG 3450b / ENAS 3450b, Principles and Applications of Interfacial Phenomena** Kyle Vanderlick
This course covers the nature and consequences of both flexible and rigid interfaces, such as those associated with liquids and solids respectively. We examine the properties of interfaces as they exist alone, as a collective (e.g., colloids), and also as they interact demonstrably with one another. An integral part of this course is the introduction and application of engineering analysis to calculate and predict behaviors central to technological applications. This course is designed for engineering majors. Other STEM majors are welcome but physics and multivariable calculus are prerequisites. Ideally, students should also have taken thermodynamics but this is not formally required. SC

CENG 3730a / CENG 373 / ENVE 3730a, Air Pollution Control Drew Gentner
An overview of air quality problems worldwide with a focus on emissions, chemistry, transport, and other processes that govern dynamic behavior in the atmosphere. Quantitative assessment of the determining factors of air pollution (e.g., transportation and other combustion–related sources, chemical transformations), climate change, photochemical "smog," pollutant measurement techniques, and air quality management strategies. Prerequisite: ENVE 120. QR, SC RP

* **CENG 3770b / ENVE 3770b, Water-Energy Nexus** Lea Winter
This course explores processes and technologies at the water-energy nexus. We utilize chemical and environmental engineering fundamentals to explore the links between maintaining clean water supply and energy security globally, as well as implications for environmental contamination and climate change. We develop a quantitative understanding of water chemistry and energy considerations for topics including traditional water and wastewater treatment, energy recovery from wastewater, membrane processes, water electrolysis for energy storage and electrochemical contaminant conversion, industrial water consumption and wastewater production, underground water sources and water for oil and gas, opportunities for reuse of nontraditional source waters and contaminant valorization, and considerations for decentralization, resilience, and electrification. Quantitative understanding of these processes will be attained based on mass and energy balances, systems engineering, thermodynamics, and kinetics. Prerequisite: ENVE 120 or permission of instructor. The course is primarily designed for juniors and seniors majoring in environmental engineering, but students in other engineering majors are welcome. Students in non-engineering majors are also welcome but are encouraged to communicate with

the instructor to make sure they have sufficient background knowledge in required mathematics. QR, SC

CENG 4110a, Separation and Purification Processes Mingjiang Zhong
Theory and design of separation processes for multicomponent and/or multiphase mixtures via equilibrium and rate phenomena. Topics include single-stage and cascaded absorption, adsorption, extraction, distillation, partial condensation, filtration, and crystallization processes. Applications to environmental engineering (air and water pollution control), biomedical-chemical engineering (artificial organs, drug purification), food processing, and semiconductor processing. Prerequisite: CENG 300 or 315 or permission of instructor. QR, SC RP

CENG 4120Lb, Chemical Engineering Laboratory and Design Lisa Pfefferle
An introduction to design as practiced by chemical and environmental engineers. Engineering fundamentals, laboratory experiments, and design principles are applied toward a contemporary chemical process challenge. Sustainability and economic considerations are emphasized. SC

CENG 4160b / ENVE 4160b, Chemical Engineering Process Design Yehia Khalil
Study of the techniques for and the design of chemical processes and plants, applying the principles of chemical engineering and economics. Emphasis on flowsheet development and equipment selection, cost estimation and economic analysis, design strategy and optimization, safety and hazards analysis, and environmental and ethical considerations. Enrollment limited to seniors majoring in Chemical Engineering or Environmental Engineering. QR, SC RP

CENG 4710a or b, Independent Research Paul Van Tassel
Faculty-supervised individual student research and design projects. Emphasis on the integration of mathematics with basic and engineering sciences in the solution of a theoretical, experimental, and/or design problem. May be taken more than once for credit.

CENG 4800a, Chemical Engineering Process Control Michael Loewenberg
Transient regime modeling and simulations of chemical processes. Conventional and state-space methods of analysis and control design. Applications of modern control methods in chemical engineering. Course work includes a design project. Prerequisite: ENAS 194 or permission of instructor. QR, SC

* **CENG 4900a or b, Senior Research Project** Paul Van Tassel
Individual research and/or design project supervised by a faculty member in Chemical Engineering, or in a related field with permission of the director of undergraduate studies.

Chemistry (CHEM)

CHEM 1340La or b, General Chemistry Laboratory I Staff
An introduction to basic chemistry laboratory methods. Techniques required for quantitative analysis of thermodynamic processes and the properties of gases. To accompany or follow CHEM 161 or 163. May not be taken after a higher-numbered laboratory course. SC RP 0 Course cr

CHEM 1360La or b, General Chemistry Laboratory II Staff
Introduction to rate and equilibrium measurements, acid-base chemistry, synthesis of inorganic compounds, and qualitative/quantitative analysis. After CHEM 134L or the equivalent in advanced placement. To accompany or follow CHEM 165 or 167. May not be taken after a higher-numbered laboratory course. SC RP 0 Course cr

* **CHEM 1610a or b, General Chemistry I** Staff
A comprehensive survey of modern descriptive, inorganic, and physical chemistry. Atomic theory, stoichiometry, thermochemistry, chemical periodicity, concepts in chemical bonding, and the shapes of molecules. Appropriate either as a first chemistry course or for students with one year of high school chemistry. Attendance at a weekly discussion section required. Normally accompanied by CHEM 134L. QR, SC RP 0 Course cr

* **CHEM 1650a or b, General Chemistry II** Staff
Topics include kinetics, chemical equilibrium, acid-base chemistry, free energy and entropy, electrochemistry, and nuclear chemistry. Attendance at a weekly discussion section required. Prerequisite: CHEM 161. Normally accompanied by CHEM 136L. Enrollment by placement only. QR, SC RP 0 Course cr

* **CHEM 1700a, Quantitative Foundations of General Chemistry** Patrick Holland
An advanced course emphasizing conceptual aspects and physical principles in general chemistry. Fulfills the general chemistry prerequisite for organic chemistry. Attendance at a weekly discussion section required. Enrollment by placement only. QR, SC

* **CHEM 1710La, Quantitative Foundations of General Chemistry Lab** Jonathan Parr and Laura Herder
This laboratory affords students at the beginning of their science studies to have meaningful and foundational engagement with experimental chemistry. The lab equips students for further science laboratory classes and laboratory research in the sciences. The course is structured to take students with little or no prior exposure to practical work in the sciences through a series of experiments in which they use scientific apparatus and practice techniques that are core to experimental work in chemistry and other physical sciences. This includes experiments involving calorimetry, electrochemistry, volumetric analysis, computational chemistry, spectroscopy, and synthesis. Students finish with a strong grounding in laboratory safety and experimental design, as well as in the collection and recording of measured and observational data, in addition to exposure to the apparatus and software platforms common to many physical science laboratories. This lab qualifies students for the organic chemistry laboratory sequence (CHEM 222L/223L). Prerequisites: By course placement. This laboratory class is intended to accompany CHEM 1700 only and may not be taken by any student unless they are either enrolled in CHEM 1700 concurrently or have already completed CHEM 1700 and have not in either case completed a higher numbered Chemistry laboratory class, SC ½ Course cr

* **CHEM 1740a, Organic Chemistry for First Year Students I** Staff
An introductory course focused on current theories of structure and mechanism in organic chemistry, their development, and their basis in experimental observation. Open to first-year students with excellent preparation in chemistry, mathematics, and physics who have taken the department's advanced chemistry placement examination.

Attendance at a weekly discussion section required. Normally accompanied by CHEM 222L. Enrollment by placement only. SC RP 0 Course cr

* **CHEM 1750b, Organic Chemistry for First Year Students II** Scott Miller
Continuation of CHEM 174. Survey of simple and complex reaction mechanisms, spectroscopy, organic synthesis, and the molecules of nature. Attendance at a weekly discussion section required. After CHEM 174. Normally accompanied by CHEM 223L. Enrollment by placement only. SC RP 0 Course cr

CHEM 2200a or b, Organic Chemistry Staff
An introductory course covering the fundamental principles of organic chemistry. The laboratory for this course is CHEM 222L. After college-level general chemistry. Students who have earned a grade lower than C in general chemistry are cautioned that they may not be sufficiently prepared for this course. Usually followed by CHEM 221 or 230. SC RP 0 Course cr

CHEM 2210b, The Organic Chemistry of Life Processes David Spiegel
The principles of organic reactivity and how they form the basis for biological processes. The laboratory for this course is CHEM 223L. After CHEM 220. Students who have earned a grade lower than C in CHEM 220 are cautioned that they may not be sufficiently prepared for this course. SC RP 0 Course cr

CHEM 2220La or b, Laboratory for Organic Chemistry I Staff
First term of an introductory laboratory sequence covering basic synthetic and analytic techniques in organic chemistry. Prerequisite: CHEM 136L or equivalent. After or concurrently with CHEM 174 or 220. SC 0 Course cr

CHEM 2230Lb, Laboratory for Organic Chemistry II Christine DiMeglio
Second term of an introductory laboratory sequence covering basic synthetic and analytic techniques in organic chemistry. Prerequisite: CHEM 222L. After or concurrently with CHEM 175, 221, or 230. SC 0 Course cr

* **CHEM 2260La, Advanced Chemistry Lab** Christine DiMeglio
An advanced course in chemistry laboratory technique intended to develop student independence and confidence with planning and executing experimental procedures, while performing synthetic and analytical experiments. The course includes workshops, interactions with specialists in instrumentation, library science, and safety, an individual project, and training in the use of various instrumentation and techniques. Students must have received a grade for General Chemistry Lab I and II (CHEM 134L and 136L), or their equivalents, such as a college course elsewhere or the Chemistry Department placement exam. Organic Chemistry Lecture I and II (CHEM 220 and 221) and Organic Chemistry Labs I and II (CHEM 222L and CHEM 223L), or their equivalents are also pre-requisites. Enrollment is limited; capped to 7 people. Please e-mail course instructor to be put on a waitlist if cap is reached. WR, SC RP

CHEM 2510Lb, Inorganic Chemistry Laboratory Jonathan Parr
Introductory laboratory course covering synthetic and physical characterization techniques in inorganic chemistry. Prerequisite: 222L; concurrently with or after CHEM 252. SC 0 Course cr

CHEM 2520b, Introductory Inorganic Chemistry James Mayer
Principles and applications of modern inorganic chemistry. Introduction to some of the fundamental concepts of solid-state chemistry, coordination chemistry, bioinorganic

chemistry, and organometallic chemistry. Prerequisite: college-level general chemistry. After or concurrently with CHEM 220 or by permission of instructor. May not be taken after CHEM 450, 452, or 457. SC RP 0 Course cr

CHEM 3190b, Chemical Biology: Chemical Dissection & Reprogramming of Biological Systems Jason Crawford
This course is organized around the central dogma of life, progressing from genes to proteins and higher-order cellular structures, including core application areas such as imaging, chemical genetics, activity-based protein profiling, and natural product discovery and biosynthesis. Prerequisites: CHEM 220 and CHEM 221. SC 0 Course cr

CHEM 3300La, Laboratory for Physical Chemistry I Staff
Introduction to the tools and techniques of modern experimental physical chemistry, including analog/digital electronics, quantitative measurements of basic thermodynamic properties, and nuclear magnetic resonance spectrometry. After or concurrently with CHEM 328 or 332. SC RP 0 Course cr

CHEM 3310Lb, Laboratory for Physical Chemistry II Paul Cooper
Application of physical methods to chemical analysis by spectroscopic and spectrometric techniques. Please see the course syllabus for details regarding course registration. After CHEM 330L. After or concurrently with CHEM 333. SC RP 0 Course cr

* **CHEM 3320a, Physical Chemistry with Applications in the Physical Sciences I** Staff
CHEM 332 is an introductory course to fundamentals of physical chemistry, with an emphasis on macroscopic phenomena in chemical, physical, and biological systems. This course covers topics including fundamental laws of thermodynamics, properties of gases, phase equilibrium and transition, properties of solutions, chemical equilibrium, and chemical kinetics. This course, together with CHEM 333, provides a foundation for understanding the connection between chemistry and physics as well as theoretical chemistry. Prerequisites: introductory physics (PHYS 1700, 1800, or higher), college-level general chemistry (CHEM 1610/1650, or CHEM 1700, and/or CHEM 163/167), and single-variable calculus (Math 1150, 1160, or upper-level MATH equivalents), all taken for a grade. May not be taken after CHEM 3280. QR, SC RP 0 Course cr

* **CHEM 3330b, Physical Chemistry with Applications in the Physical Sciences II** Patrick Vaccaro
Continuation of CHEM 332, including topics drawn from quantum mechanics, atomic/molecular structure, spectroscopy, and statistical thermodynamics. Prerequisite: CHEM 328 or 332, or permission of instructor. QR, SC RP 0 Course cr

* **CHEM 4000a, Current Chemistry Seminar** Sarah Slavoff and Ruth Son
Designed to engage students in the Chemistry research-seminar program by providing requisite scientific guidance and a forum for directed discussion. Participants explore current avenues of chemical research as presented orally by the prime movers in the field, thereby exploring the frontiers of current knowledge while still retaining the structured environment of a classroom. May fulfill all or part of the senior requirement for the Chemistry major, as detailed in the program description in the YCPS.

CHEM 4020a, Fundamentals of Transition Metal Chemistry James Mayer
This half-term course covers the structures and properties of coordination compounds, and strategies for the design and analysis of new compounds. Elements of chelating

ligands, spectroscopic methods, and magnetism are addressed. Prerequisites: Two terms of organic chemistry, and Chem 252 or equivalent. SC ½ Course cr

CHEM 4030b, Fundamentals of Organometallic Chemistry Nilay Hazari
A half-term survey of the main principles of organometallic chemistry that enable students to understand basic concepts in the field. It prepares students for CHEM 404, Applications of Organometallic Chemistry, the second half of this course. Prerequisites: Two terms of organic chemistry and Chem 252 or equivalent experience. SC ½ Course cr

CHEM 4060a, Bioinorganic Spectroscopy Gary Brudvig
This course is an advanced introduction to biological inorganic chemistry with an emphasis on the methods used to characterize the active sites of metalloproteins. The major physical methods used in the determination of molecular structure, bonding and physical properties of metal ions in proteins are introduced. Prerequisite: A general knowledge of biochemistry and familiarity with both inorganic coordination chemistry and physical chemistry. SC ½ Course cr

CHEM 4070a, Bioinorganic Mechanisms Gary Brudvig
This course is an advanced introduction to biological inorganic chemistry. An overview of the relevant geometric and electronic structures of metalloprotein active sites are presented and related to each protein's function. The objective is to define and understand the function of metals in biology in terms of structure. Prerequisite: CHEM 406 or permission of instructor. It will be assumed that students have a general knowledge of biochemistry and are familiar with both inorganic coordination chemistry and physical chemistry. SC ½ Course cr

CHEM 4080a, Principles of Materials Chemistry Hailiang Wang
This course is an advanced introduction to materials chemistry. It aims to serve senior undergraduate students who are interested in learning and applying chemical principles for materials research and applications. Fundamental principles in solid-state chemistry, including crystal structures and chemical interactions, will be taught. Ionics, metal, semiconductor and polymer materials, including their synthesis, structures, properties and applications, will be discussed. Prerequisite: General chemistry, inorganic chemistry and physical chemistry, or equivalent experience. SC ½ Course cr

CHEM 4160a, Organic Structure and Energetics William Jorgensen
The course covers concepts in physical organic chemistry including molecular structure & bonding, conformational energetics, electronic effects, thermochemistry, ring strain, non-covalent interactions, molecular recognition, and host-guest chemistry. Prerequisites: Two terms of organic chemistry and two terms of physical chemistry or related courses or permission of the instructor. SC ½ Course cr

CHEM 4170a, Kinetics and Thermodynamics in Organic Systems Scott Miller
The course generally follows Organic Structure and Energetics. This module covers concepts in physical organic chemistry including acid-base chemistry, advanced issues in stereochemistry, kinetics and thermodynamics, as well as experiments and techniques employed in mechanistic analysis. Issues in catalysis are addressed throughout. Prerequisites: CHEM 416 and two terms of introductory organic chemistry, and two terms of physical chemistry. Permission of the instructor may be sought for potential exceptions. SC ½ Course cr

CHEM 4200a, Chemical Biology of Nucleic Acids Sarah Slavoff
This course provides a chemical perspective on fundamental concepts and applications in the chemical biology of nucleic acids. Covered topics include nucleic acid synthesis, functional and modified nucleic acids, sequencing, CRISPR/Cas9, and analytical methods. SC ½ Course cr

CHEM 4210a, Protein Design & Catalysis Jason Crawford
The lecture component of this course largely focuses on protein function, catalysis, and the chemistry and biology of diverse small molecule products. The course also serves to support students in writing an effective NSF style research proposal in Chemical Biology and communicating its contents to a diverse scientific audience. Prerequisites: Two semesters of undergraduate organic chemistry (CHEM 174/175 and/or CHEM 220/221). A basic understanding of biochemistry and molecular biology is also assumed, but you can "catch up" by carefully and thoroughly reading the course materials and recommended books. SC ½ Course cr

CHEM 4240a, Chemical Biology of Drug Discovery David Spiegel
This course explores the design and enablement of medicines derived from a convergence of concepts and techniques from chemistry and biology. Topics include: small molecule drug discovery concepts and tools, drug metabolism, protein therapeutics, hybrid chemical/biologic drugs, and bi-functional molecules. Modern approaches for target discovery and validation are also discussed. The course is not organized around a textbook. Rather, material covered in lectures will be the focus of the course and supplementary reading will be recommended, mostly from modern research literature. Reading lists will be distributed at the outset of the module. Prerequisites: Undergraduate level organic chemistry I and II (CHEM 174/175 and/or CHEM 220/221), biochemistry and molecular biology. SC ½ Course cr

CHEM 4320a, Synthetic Methods in Organic Chemistry I Jon Ellman
Compound synthesis is essential to the discovery and development of new chemical entities with a desired property whether that be for fundamental study or for a more applied goal such as a new pharmaceutical, agrochemical, or material. In this course we emphasize key transformations and principles to provide a framework for the efficient design and synthesis of organic compounds. Prerequisites: Two terms of organic chemistry and one term of introductory inorganic chemistry, or related course, or permission of the instructor. SC ½ Course cr

CHEM 4330a, Synthetic Methods in Organic Chemistry II Jon Ellman
Compound synthesis is essential to the discovery and development of new chemical entities with a desired property whether that be for fundamental study or for a more applied goal such as a new pharmaceutical, agrochemical, or material. In this course we emphasize key transformations and principles to provide a framework for the efficient design and synthesis of organic compounds. This course builds on the knowledge learned in CHEM 432. Prerequisite: CHEM 432 or permission of instructor. SC ½ Course cr

* **CHEM 4720b, Introduction to Statistical Mechanics 1** Victor Batista
A half-term introduction to modern statistical mechanics, starting with fundamental concepts on quantum statistical mechanics to establish a microscopic derivation of statistical thermodynamics. Topics include ensembles, Fermi, Bose and Boltzmann statistics, density matrices, mean field theories, phase transitions, chemical reaction

dynamics, time-correlation functions, Monte Carlo simulations and Molecular Dynamics simulations. Prerequisites: Physical chemistry, multivariable calculus or equivalent experience. SC ½ Course cr

* **CHEM 4730b, Introduction to Statistical Mechanics 2** Victor Batista
A half-term continuation of the introduction to modern statistical mechanics, with focus on quantum statistical mechanics of liquids, Monte Carlo methods and linear response theory (Chapters 6–8 of the textbook). Classical results are obtained according to the classical limit of the quantum mechanical description. Topics include the Monte Carlo simulations and Molecular Dynamics simulations for the description of the Ising model, fluids, solvation of solutes, alchemist free energy calculations, kinetics and transport properties. Prerequisites: Physical chemistry, multivariable calculus or equivalent experience. SC ½ Course cr

CHEM 4780a, Molecules and Radiation I Kurt Zilm
This course is an efficient entry to the study of molecular spectroscopy and provides a broad foundation for chemical physicists, biophysicists, and engineers. It covers a general treatment of the quantum mechanics of spectroscopy and specific applications for time-dependent systems. This course focuses on matrix mechanics, perturbation theory, and angular momentum. Prerequisite: previous exposure to quantum mechanics at the level of physical chemistry, or permission of the instructor. There will be a brief review of some of this material in class. SC ½ Course cr

CHEM 4790a, Molecules and Radiation II Kurt Zilm
This course is a continuation and builds on the foundation of quantum mechanics learned in CHEM 4780/5780. During CHEM 4790/5790, the curriculum will continue with group theory, time-dependent quantum mechanics and end with applications to coherent optical and magnetic resonance. This course was designed recognizing that most of the quantum needed to understand modern spectroscopy, and is a very useful foundation for other magnetic resonance and optical spectroscopy courses offered by the Department. CHEM 4780 or permission of the instructor SC ½ Course cr

* **CHEM 4800a or b, Introduction to Independent Research in Chemistry** Sarah Slavoff
After consultation with the DUS, students engage individual experimental and/or theoretical research problems in the laboratories of a selected faculty member within the Chemistry department. At the end of the term, students submit a brief report summarizing goals, methods, and accomplishments. For each term of enrollment, students must complete the CHEM 480 registration form, available in the DUS office, and have it signed by their faculty research mentor. It must be submitted to the Chemistry DUS for final approval no later than the last week of classes in the immediately preceding academic term. Individuals wishing to perform independent research must have demonstrated proficiency in the aspects of chemistry required for the planned project, as ascertained by the supervising faculty member, and must meet basic safety requirements prior to undertaking any activities, including certified completion of the online courses entitled *Laboratory Chemical Training* and *Hazardous Chemical Waste Training* administered by the Office of Environmental Health and Safety (EHS) at http://ehs.yale.edu/training. At least ten hours per week of research are required (including time spent on requisite safety training), with the faculty mentor

affirming this level of student commitment by midterm. This course may be taken multiple times for Pass/Fail credit, subject to restrictions imposed by Yale College. RP

*** CHEM 490oa or b, Independent Research in Chemistry** Staff
Senior Chemistry majors engage individual experimental and/or theoretical research problems in the laboratories of a selected faculty member in the Chemistry department or in a closely related field of molecular science. CHEM 490 registration forms, found in the DUS office, must be signed by the student's faculty research mentor and submitted it to the Chemistry DUS for final approval no later than the last week of classes in the immediately preceding academic term. Mandatory class meetings address issues of essential laboratory safety and ethics in science, with other class sessions focusing on core topics of broad interest to Chemistry students, including online literary research, oral presentation skills, and effective scientific writing. At least ten hours of research are required per week. Students are assigned letter grades, subject to restrictions imposed by Yale College. In special cases and with DUS approval, juniors may take this course. RP

CHEM 492ob, Biochemical Rates and Mechanisms I J Patrick Loria
An advanced treatment of enzymology. Topics include transition state theory and derivation of steady-state and pre-steady-state rate equations. The role of entropy and enthalpy in accelerating chemical reactions is considered, along with modern methods for the study of enzyme chemistry. These topics are supplemented with in-depth analysis of the primary literature Prerequisites: CHEM 332 or equivalent, two semesters of organic chemistry, Math 115. SC ½ Course cr

*** CHEM 495ob, Molecular Spectroscopy and Dynamics** Mark Johnson
This course covers the traditional treatment of molecular spectroscopy, including angular momentum coupling and selection rules for electric dipole excitations in atoms and diatomic molecules. It also explores vector aspects of the interaction of light with molecules in the molecular frame, which involves consideration of the polarization states of the light beam. Polyatomic molecules expand the complexity of the interactions through introduction of normal modes and anharmonic couplings both within the ground electronic state and between electronic states. That background is then leveraged to explore intra- and inter-molecular energy flow in molecules when isolated in the gas phase or immersed in solvent. Prerequisite: One graduate level course in quantum mechanics and/or molars. ½ Course cr

Child Study (CHLD)

*** CHLD 125oa / EDST 1125a / PSYC 125 / PSYC 1425a, Child Development** Ann Close and Carla Horwitz
This course is first in a sequence including Theory and Practice of Early Childhood Education (CHLD127/PSYCH 127/EDST 127) and Language Literacy and Play (CHLD 128/PSYCH 128/EDST 128). This course provides students a theoretical base in child development and behavior and tools to sensitively and carefully observer infants and young children. The seminar will consider aspects of cognitive, social, and emotional development. An assumption of this course is that it is not possible to understand children—their behavior and development—without understanding their families and culture and the relationships between children and parents. The course will give an overview of the major theories in the field, focusing on the complex interaction between

the developing self and the environment, exploring current research and theory as well as practice. Students will have the opportunity to see how programs for young children use psychodynamic and interactional theories to inform the development of their philosophy and curriculum. Weekly Observations:-Total Time Commitment 3 hours per week. Students will do two separate weekly observations over the course of the semester. They will observe in a group setting for 2 hours each each week at a Yale affiliated child care center. Students will also arrange to do a weekly 1 hour observation (either in person or virtually) of a child under the age of 6. Students must make their own arrangements for these individual observations. If it is not possible to arrange a child to observe, please do not apply to take this course. For a portion of class meetings, the class will divide into small supervisory discussion groups. Priority given to juniors, seniors, Ed Study students. WR, SO

* **CHLD 1270b / EDST 3127b / PSYC 1427b, Theory and Practice of Early Childhood Education** Carla Horwitz

The course deals with development and delivery of curricula for **young children ages 3-6** and the current context of educational reform and debate. Goals are to deepen insights through critical analysis of educational programs for young children in light of current research and developmental theory and to understand how culture and political context contribute to the practice of education. Regularly scheduled seminar discussions and workshops that engage students with learning materials emphasize the ongoing dynamic process of developing emergent curriculum and focus on methods of creating a responsive, inclusive environment; planning and assessment; appreciating cultural and linguistic diversity; teachers' roles; anti-bias education; working with families; conceptualizing the professional challenges of collaborating on a teaching team within the organization of the school; standards and accountability and the role of policy and advocacy in educational change. The course will use newspaper and magazine articles and other recent media as primary sources in addition to current research and other texts. Students must arrange to do a weekly one-hour observation (in-person or virtually) of a child under age 6 and an additional 2 hour in-person classroom observation at Calvin Hill Day Care Center or another Yale-affiliated child care center. Total observation time commitment is 3 hours per week. If you are unable to find a child to observe, please do not register for this class. CHLD 125 is recommended. Permission of instructor is required. Priority given to juniors, seniors, and Ed Study students. WR, SO RP

* **CHLD 1280b / EDST 3128b / PSYC 1428b, Language, Literacy, and Play** Ann Close and Carla Horwitz

The focus of this course will be to demonstrate the complicated role that play has in the development of language and literacy skills. A major part of each topic presentation will be a discussion of the role that play has in the curriculum in enhancing these developmental areas. There is a widespread consensus that play is an essential component of a developmentally appropriate early childhood curriculum. Research indicates that play enhances a child's creativity, intellectual development and social emotional development. Because learning to play, learning language and learning literacy skills are all part of the process of thinking and communication**, the course will provide a view which attempts to demonstrate the integration of language, literacy and play in an early childhood education curriculum.** Theoretical aspects of each of these developmental areas will be examined first, and it will be that theoretical

understanding which will be the basis upon which ideas about curriculum will be explored, experienced and discussed. Students must arrange to do a weekly one-hour observation (in-person or virtually) of a child under age 6 and an additional 2 hour in-person classroom observation at Calvin Hill Day Care Center or another Yale-affiliated child care center. Total observation time commitment is 3 hours per week. If you are unable to find a child to observe, please do not register for this class. Permission of instructor. Enrollment priority will be given to juniors, seniors, and Education Studies Certificate students. WR, SO RP

* **CHLD 3500b / EDST 1350b / EDST 350, Autism and Related Disorders** Mariana Torres-Viso, Kelly Powell, and James McPartland
Weekly seminar focusing on autism and related disorders of socialization. A series of lectures on topics in etiology, diagnosis and assessment, treatment and advocacy, and social neuroscience methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, residence, or treatment setting for individuals with autism spectrum disorders. Details about admission to the course are explained at the first course meeting. Prerequisite: an introductory psychology course. SO

Chinese (CHNS)

* **CHNS 1100a, Elementary Modern Chinese I** Staff
Intended for students with no background in Chinese. An intensive course with emphasis on spoken language and drills. Pronunciation, grammatical analysis, conversation practice, and introduction to reading and writing Chinese characters. L1 RP 1½ Course cr

CHNS 1120a, Elementary Modern Chinese for Heritage Speakers Staff
First level of the advanced learner sequence. Intended for students with some aural proficiency but very limited ability in reading and writing Chinese. Training in listening and speaking, with emphasis on reading and writing. Placement confirmed by placement test and by instructor. L1 1½ Course cr

* **CHNS 1200b, Elementary Modern Chinese II** Rongzhen Li
Continuation of CHNS 110. After CHNS 110 or equivalent. L2 1½ Course cr

* **CHNS 1300a, Intermediate Modern Chinese I** Staff
An intermediate course that continues intensive training in listening, speaking, reading, and writing and consolidates achievements from the first year of study. Students improve oral fluency, study more complex grammatical structures, and enlarge both reading and writing vocabulary. After CHNS 120 or equivalent. L3 RP 1½ Course cr

* **CHNS 1320a, Intermediate Modern Chinese for Heritage Speakers** Staff
The second level of the advanced learner sequence. Intended for students with intermediate oral proficiency and elementary reading and writing proficiency. Students receive intensive training in listening, speaking, reading, and writing, supplemented by audio and video materials. The objective of the course is to balance these four skills and work toward attaining an advanced level in all of them. Prerequisite: CHNS 122b or equivalent. L3 RP 1½ Course cr

* **CHNS 1500a, Advanced Modern Chinese I** Staff
Third level of the standard foundational sequence of modern Chinese, with study in speaking, listening, reading, and writing. Use of audiovisual materials, oral presentations, skits, and longer and more frequent writing assignments to assimilate more sophisticated grammatical structures. Further introduction to a wide variety of written forms and styles. Use of both traditional and simplified forms of Chinese characters. After CHNS 140 or equivalent. L5

* **CHNS 1520a, Advanced Modern Chinese for Heritage Speakers** Staff
This course is intended for heritage speakers with intermediate high to advanced low speaking and listening skills and with intermediate reading and writing skills. The class follows CHNS 142 in the heritage track. The goal of the course is to help students effectively expand their skills in reading and writing while concurrently addressing the need to improve their listening and oral skills in formal environments. The materials cover a variety of topics relating to Chinese culture, society, and cultural differences, supplemented with authentic video materials. Prerequisite: CHNS 142 or equivalent. L5

* **CHNS 1580a, Advanced Chinese III through Films and Stories** Staff
Fourth level of the standard foundational sequence of modern Chinese, with study in speaking, listening, reading, and writing. Readings in a wide range of subjects form the basis of discussion and other activities. Students consolidate their skills, especially speaking proficiency, at an advanced level. Materials use both simplified and traditional characters. (Previously CHNS 154.) After CHNS 151 or equivalent. L5

* **CHNS 1600a, Chinese Through the Lens: Discovering Modern China** Ninghui Liang
This course invites students to explore contemporary Chinese society, culture, and language through films, TV programs, and social media videos. By engaging with authentic visual narratives and written materials, students will not only enhance their Chinese language skills in listening, speaking, reading, and writing but also gain deeper insights into everyday life, values, and social changes in modern China. Each unit combines film-based discussions, vocabulary development, and cultural reflection, encouraging learners to think critically and communicate meaningfully in Chinese. After CHNS 153, or 159, or equivalent. L5

* **CHNS 1620a, Advanced Chinese through History and Culture** Rongzhen Li
This course is intended for both heritage and non heritage learners with advanced proficiency. Students develop sophisticated language skills through working with authentic written materials, images, and videos concerning historical events, historical figures, artists, writers, and philosophers. Activities include working with translation tools, discussions, debates, presentations, oral and written exercises on platforms such as Playposit and Perusall, and collaborative projects. After CHNS 153, or 157, or 159, or equivalent. L5

* **CHNS 1640a, Chinese for Reading Contemporary Fiction** Wei Su
Selected readings in Chinese fiction of the 1980s and 1990s for the purpose of developing advanced language skills in reading, speaking, and writing. After CHNS 153, or 157, or 159, or equivalent. L5

* **CHNS 1660a, Chinese for Current Affairs** Staff
Advanced language course with a focus on speaking and writing in formal styles. Current affairs are used as a vehicle to help students learn advanced vocabulary, idiomatic expressions, complex sentence structures, news writing styles and formal stylistic register. Materials include texts and videos selected from news media worldwide to improve students' language proficiency for sophisticated communications on a wide range of topics. After CHNS 153, 157, or 159. L5

* **CHNS 1680a, Chinese for Global Enterprises** Haiwen Wang
Advanced language course that familiarizes students with Chinese business terminology and discourse through discussion of China's economic and management reforms, marketing, economic laws, business culture and customs, and economic relations with other countries. Case studies from international enterprises that have successfully entered the Chinese market. Prerequisite: After CHNS 153, or CHNS 157, or CHNS 159, or equivalent. L5

CHNS 1700a, Introduction to Literary Chinese I Pauline Lin
Reading and interpretation of texts in various styles of literary Chinese (*wenyan*), with attention to basic problems of syntax and literary style. Course conducted in English. After CHNS 151, 153, 157, or equivalent. L5

CHNS 1710b, Introduction to Literary Chinese II Pauline Lin
Continuation of CHNS 170. After CHNS 170. L5

* **CHNS 1720a, Chinese for Scholarly Conversation** Yu-Lin Saussy
This course aims to prepare students for the language requirements of advanced research or employment in a variety of China-related fields. Materials include readings on contemporary social, cultural, and political issues, which are written by prominent scholars in related fields. This level is suitable for students who have had four years of college Chinese or who have taken three years of an accelerated program for heritage speakers. After CHNS 153, 159, 157, or equivalent, or permission of the instructor. L5

CHNS 2000a / EALL 2000a / EAST 2202a / HUMS 4527a, The Chinese Tradition Staff
An introduction to the literature, culture, and thought of premodern China, from the beginnings of the written record to the turn of the twentieth century. Close study of textual and visual primary sources, with attention to their historical and cultural backdrops. Students enrolled in CHNS 200 join a weekly Mandarin-language discussion section. No knowledge of Chinese required for students enrolled in EALL 200. Students enrolled in CHNS 200 must have L5 proficiency in Mandarin or permission of the course instructor. HU 0 Course cr

Classical Civilization (CLCV)

* **CLCV 0531a / HIST 0724a, The Age of Cleopatra** Joseph Manning
This course introduces students to historical method using a pivotal and fascinating period in Mediterranean history. This course goes far beyond the typical framework, mainly from Roman sources, to examine Egypt in the age of Cleopatra, 50–30 BCE and the much wider world. We examine the reception of Cleopatra through the lens of women's history. Enrollment is limited to first-year students. WR, HU

* **CLCV 1381b / HUMS 434b / NELC 1300b, Mesopotamia's Literary Legacy** Kathryn Slanski
This seminar explores myth, epic, love poetry, and wisdom literature from the ancient Near East, ca. 3000–323 BCE, within its own cultural context and in dialogue with literature from ancient Greece and the Hebrew Bible, conduits by which the literary legacy of the ancient Near East has left its mark on the Western tradition. HU

CLCV 1701a / ARCG 2143a / HSAR 3243a, Greek Art and Architecture Staff
Monuments of Greek art and architecture from the late Geometric period (c. 760 B.C.) to Alexander the Great (c. 323 B.C.). Emphasis on social and historical contexts. HU
0 Course cr

CLCV 1901a / PHIL 1125a, Introduction to Ancient Philosophy Staff
An introduction to ancient philosophy, beginning with the earliest pre-Socratics, concentrating on Plato and Aristotle, and including a brief foray into Hellenistic philosophy. Intended to be taken in conjunction with PHIL 126. WR, HU 0 Course cr

* **CLCV 2391a / NELC 1690a, Visible Language: The Origins of Writing in Mesopotamia and Ancient Egypt** Klaus Wagensonner
Exploration of writing in the ancient Near East and the profound effects this new method of communication had on human society. Focus on Egypt and Mesopotamia, where advanced writing systems first developed and were used for millennia, with consideration of Chinese, Mayan, and Indus Valley writing systems as well. Previously NELC 168. HU

CLCV 2501a / HIST 1217a / HUMS 2501a, The Roman Republic Staff
The origins, development, and expansion of Rome from the earliest times to the deaths of Caesar and Cicero. Cultural identity and interaction; slavery, class, and the family; politics, rhetoric, and propaganda; religion; imperialism; monumentality and memory; and the perception and writing of history. Application of literary and archaeological evidence. HU 0 Course cr

CLCV 2502b / HIST 1218b, The Roman Empire Andrew Johnston
The history of the Roman Empire from its establishment by Augustus to the reign of Justinian. Attention to social, intellectual, and religious changes, as well as to the framework of historical events within which these changes took place, and to the processes by which the Roman Empire was replaced by the institutions of the Western Middle Ages and the Byzantine Empire. HU 0 Course cr

CLCV 2685a / HIST 1212a, The Ancient Economy Staff
A survey of the economies of the ancient Mediterranean world, with emphasis on economic institutions, the development of the economies over time, ancient economic thought, and the interrelationships between institutions and economic growth. Material evidence for studying the economies of the ancient world, including coinage, documentary material, and archaeology. HU 0 Course cr

CLCV 2691a / GLBL 1204a / HIST 1702a, Global Leadership, 600 BCE–600 CE Staff
This course provides students with an accessible and engaging introduction to both the classical world and the problems of political organization and leadership through time and across societies. Students learn to think comparatively between individuals, societies, and systems and to analyze different ideals of leadership. This means considering not only traditional masculine and military conceptions of rule but also the leadership roles and styles of women, slaves, and rebels. We hope to bring into view,

in other words, the intersectional challenges to power faced by non-traditional leaders in a world dominated by gender, class, and cultural prejudices, and to show how non-traditional leaders confronted and overcame these. Students draw upon this experience to access the premodern world as an alternative but related historical reality which can productively inform their engagement with the present. HU o Course cr

* **CLCV 3340a / HUMS 1770a / PLSC 306a / PLSC 3369a, Tragedy and Politics** Daniel Schillinger

The canonical Greek tragedians—Aeschylus, Sophocles, and Euripides—dramatize fundamental and discomfiting questions that are often sidelined by the philosophical tradition. In this seminar, we read plays about death, war, revenge, madness, impossible choices, calamitous errors, and the destruction of whole peoples. Aeschylus, Sophocles, and Euripides were also piercing observers of political life. No less than Plato and Aristotle, the Attic tragedians write to elicit reflection on the basic patterns of politics: democracy and tyranny, war and peace, the family and the city, the rule of law and violence. Finally, we also approach Greek tragedy through its reception. Aristophanes, Plato, Aristotle, and Nietzsche: all these thinkers responded to tragedy. Texts include Aeschylus, *Oresteia;* Aristophanes, *Frogs* and *Lysistrata*; Euripides, *Bacchae*, *Heracles*, and *Trojan Women*; Nietzsche, *The Birth of Tragedy*; Plato, *Symposium*; and Sophocles, *Antigone*, *Philoctetes*, and *Oedipus Tyrannus.* Previous work in political theory, classics, or philosophy is recommended. HU

CLCV 3350b, Food and Wine in the Ancient Greek World Egbert Bakker

Food is more than carbohydrates and proteins. It is about culture and identity, both collective and individual, and it has symbolic value. In this course we study the political, symbolic, and poetic importance of food and wine in Ancient Greece. We see how food defines humans with respect to the gods, Greeks with respect to non-Greeks, and how food is a central component of the meaning of entire epic poems, such as the *Odyssey*. But we also look at the reality of food consumption and production and how food and drink was studied by the physicians and scientists of the ancient world. Readings in translation. HU

* **CLCV 4435a, Greek Social History (600–250 BCE): New Approaches** Jessica Lamont

This advanced seminar introduces students to new ways of researching ancient Greek social history, with a focus on communities across the ancient Greek world between c.600-250 BCE, from Sicily to Thasos to the northern Black Sea. Newly published inscriptions and epigraphic corpora drive and structure the course. Major topics of study include: ancient Greek oracles (Delphi, Dodona, dice oracles), divination, women, religious cults and ritual practice, sacred laws, "magical" rites (spells, curses, and incantations), Greek colonization, north Aegean Thasos, and more. This advanced seminar is geared toward Classics and Classical Civilization senior majors, BA/MA students, and graduate students in the Depts of Classics and History. HU

* **CLCV 4771a / HSAR 4351a, Ancient Art at the Edge of Empire** Alexander Ekserdjian

This seminar treats the art made in imperial contact zones, the 'edges of empire.' Focusing on two regions, Roman-period Syria–home of multiple linguistic and religious traditions and the point of convergence between the Parthian and Roman empires–and pre-Roman southern Italy, where Greek, Etruscan, Roman, and Indigenous Italian cultural elements co-existed, the course first explores the theories concerning art and empire formed for modern historical periods before turning

to antiquity. The two main contexts under discussion allow us to investigate one 'edge' shared between two empires (Roman Syria) and in the other a world of many overlapping 'edges' (southern Italy ca. 400–100 BCE). The Yale University Art Gallery collections from the city of Dura-Europos in Roman Syria are used extensively. HU

* **CLCV 4998a and CLCV 4999b, Senior Tutorial in Classical Civilization** Jessica Lamont

Tutorial for seniors in Classical Civilization. As a culminating experience in the major, the student completes under the supervision of a faculty member an original research project, intensive language and literature study, or a creative endeavor. To register, the student must submit a written plan of study for approval by the director of undergraduate studies and the faculty instructor. Fulfills the senior requirement for the B.A. degree. Enrollment limited to senior students majoring in Classical Civilization.

Classics (CLSS)

CLSS 4998a and CLSS 4999b, Senior Tutorial in Classics Jessica Lamont

Tutorial for seniors in Classics. As a culminating experience in the major, the student completes under the supervision of a faculty member an original research project, intensive language and literature study, or a creative endeavor. To register, the student must submit a written plan of study for approval by the director of undergraduate studies and the faculty instructor. Fulfills the senior requirement for the B.A. degree. Enrollment limited to senior students majoring in Classics.

Cognitive Science (CGSC)

CGSC 216b and CGSC 2160b / LING 1160b / PSYC 116b / PSYC 1316b, Cognitive Science of Language Athulya Aravind

The study of language from the perspective of cognitive science. Exploration of mental structures that underlie the human ability to learn and process language, drawing on studies of normal and atypical language development and processing, brain imaging, neuropsychology, and computational modeling. Innate linguistic structure vs. determination by experience and culture; the relation between linguistic and nonlinguistic cognition in the domains of decision making, social cognition, and musical cognition; the degree to which language shapes perceptions of color, number, space, and gender. SO

CGSC 1100a / PSYC 130 / PSYC 1300a, Introduction to Cognitive Science Brian Scholl

An introduction to the interdisciplinary study of how the mind works. Discussion of tools, theories, and assumptions from psychology, computer science, neuroscience, linguistics, and philosophy. SO

CGSC 1390b / PSYC 1390b, Mental Lives of Babies and Animals Nicolò Cesana-Arlotti

Interdisciplinary exploration of the cognitive, social, and emotional capacities of creatures lacking language and culture. The extent to which our complex psychology is unique to mature humans; the relative richness of a mental life without language or culture. Some attention to particular human populations such as children with autism and adults with language disorders. SO

CGSC 1750a, The Mystery of Sleep Meir Kryger and Christine Won
The role in which sleep and circadian rhythms affect attention, cognition, and memory through multidisciplinary consideration of neurobiology, epidemiology, and humanities. Psychological aspects of sleep; sleep disorders; sleep deprivation; and the history of sleep in philosophy, literature, and art. This course is not open to students previously enrolled in CSPC 350, CSMC 370, or CSYC 390. SC

CGSC 2740a / CGSC 274 / NSCI 3610a / PSYC 2610a, Algorithms of the Mind Ilker Yildirim
This course introduces computational theories of psychological processes, with a pedagogical focus on perception and high-level cognition. Each week students learn about new computational methods grounded in neurocognitive phenomena. Lectures introduce these topics conceptually; lab sections provide hands-on instruction with programming assignments and review of mathematical concepts. Lectures cover a range of computational methods sampling across the fields of computational statistics, artificial intelligence and machine learning, including probabilistic programming, neural networks, and differentiable programming. Students must have a fairly strong programming background, ideally in a high-level programming language such as Julia, Python or C++. (The course will use Julia and Python substantially). Familiarity with bash scripting and HPC use are desirable. College-level calculus is required, in addition to some exposure to probability and Bayesian inference, or more broadly (probabilistic) machine learning. QR, SC, SO o Course cr

CGSC 2750b / LING 2750b / PHIL 2280b, Pragmatics Simon Charlow
Speakers often mean things they don't say, but how does a hearer figure out what the speaker meant? Which sentences are designed to change the world rather than just to represent it? How are sentences used to mean different things in different contexts? Pragmatics explores the relations between what is said and what is meant, focusing on how speech acts and the principles of "street logic"—presuppositions and implicatures—help speakers and hearers shape the landscape of a conversation. No formal prerequisites, but some familiarity with linguistics or philosophy of language will help on some of the readings. SO RP

CGSC 2770a / AFAM 1398a / EDST 1177a / PHIL 1177a, Propaganda, Ideology, and Democracy Staff
Historical, philosophical, psychological, and linguistic introduction to the issues and challenges that propaganda raises for liberal democracy. How propaganda can work to undermine democracy; ways in which schools and the press are implicated; the use of propaganda by social movements to address democracy's deficiencies; the legitimacy of propaganda in cases of political crisis. HU o Course cr

CGSC 2820a / PHIL 1182a / PSYC 1382a, Perspectives on Human Nature Staff
Comparison of philosophical and psychological perspectives on human nature. Nietzsche on morality, paired with contemporary work on the psychology of moral judgment; Marx on religion, paired with systematic research on the science of religious belief; Schopenhauer paired with social psychology on happiness. HU o Course cr

* **CGSC 3130b / CGSC 313 / PHIL 3305b / PSYC 3113b, Philosophy for Psychologists** Joshua Knobe
Introduction to frameworks developed within philosophy that have applications in psychological research. Principal topics include the self, causation, free will, and morality. Recommended preparation: a course in philosophy or psychology. HU, SO

CGSC 3380b / NSCI 3380b / PSYC 3380b, Minds, Brains, and Machines Julian Jara-Ettinger
Leibniz compared the brain to a mill, Freud to a hydraulic system, and now we think of it as a computer. Have we gotten it right? If so, what kind of computer is the brain? And what kind of software is the mind? This course explores these questions by integrating classical and cutting-edge findings from artificial intelligence, cognitive science, neuroscience, philosophy, and psychology. In this course you learn how modern artificial intelligence works—including deep neural networks, program synthesis, and neuro-symbolic approaches. You learn how to think about artificial intelligence from the perspectives of cognitive science and neuroscience. And you learn how current advances in AI are helping us understand how the mind and brain works. Conversely, you also learn how advances in psychology and neuroscience have played a key role in the biggest ideas in AI. This course is ideal for a variety of students: Psychology and cognitive science majors that want to learn about AI. CS students that want to know how to think about AI from a cognitive perspective. And anyone who wants to know how to think critically about all the advances in the study of minds, brains, and machines. Students are strongly encouraged to have taken either Introduction to Psychology (PSYC 110), or Introduction to Cognitive Science (CGSC 110). Introduction to Computer Science (CPSC 201) is also ideal. SO

* **CGSC 3950a / PHIL 3395a, Junior Colloquium in Cognitive Science** Isaac Davis
Survey of contemporary issues and current research in cognitive science. By the end of the term, students select a research topic for the senior essay. Enrollment limited to Cognitive Science majors. ½ Course cr

* **CGSC 4200b / CBIO 4200b / NSCI 4400b / PSYC 4200b, Topics in Clinical Neuroscience** Tyrone Cannon
An overview and examination of the neuroscience of psychiatric illness. We focus on cutting-edge research in humans and animals aimed at understanding the biological mechanisms that underlie psychiatric illness. Although these questions date back to early philosophical texts, only recently have experimental psychologists and neuroscientists begun to explore this vast and exciting domain of study. We discuss the evolutionary and developmental origins of individual differences in human personality, measurement issues, fundamental dimensions of psychopathology, stability/plasticity, heritability, and implications therapeutic interventions as well as the associated broader implications for public policy. A major focus is on the neurobiology of fear and anxiety, including brain circuits, molecular genetic pathways, and epigenetics. A secondary focus is on differences in behavior and biology that confer risk for the development of depression and addiction, including the biological systems involved in hedonic pleasure, motivated goal pursuit, and the regulation of impulses in the face of everyday temptation. Students should have some background in psychology; PSYC 110 and PSYC 160 preferred. SO

* **CGSC 4250b / PSYC 4250b, Social Perception** Brian Scholl
Connections between visual perception, among the earliest and most basic of human cognitive processes, and social cognition, among the most advanced forms of higher-level cognition. The perception of animacy, agency, and goal-directedness; biological motion; face perception (including the perception of facial attractiveness); gaze processing and social attention; "thin-slicing" and "perceptual stereotypes"; and social and cultural influences on perception. SO

* **CGSC 4260b / EP&E 4490b / PHIL 4426b / PSYC 4220b, The Cognitive Science of Morality** Joshua Knobe
Introduction to the emerging field of moral cognition. Focus on questions about the philosophical significance of psychological findings. Topics include the role of emotion in moral judgment; the significance of character traits in virtue ethics and personality psychology; the reliability of intuitions and the psychological processes that underlie them. HU

* **CGSC 4710a and CGSC 4720a, Directed Research in Cognitive Science** Tyler Brooke-Wilson
Research projects for qualified students. The student must be supervised by a member of the Cognitive Science faculty, who sets the requirements and directs the research. To register, a student must submit a written plan of study to the director of undergraduate studies and the faculty supervisor. The normal minimum requirement is a written report of the completed research, but individual faculty members may set alternative equivalent requirements. Only one term may be offered toward the major, with permission of the director of undergraduate studies; two terms may be offered toward the bachelor's degree.

* **CGSC 4730a and CGSC 4740a, Directed Reading in Cognitive Science** Tyler Brooke-Wilson
Individual study for qualified students who wish to investigate an area of cognitive science not covered in regular courses. The student must be supervised by a member of the Cognitive Science faculty, who sets the requirements and meets regularly with the student. To register, a student must submit a written plan of study to the director of undergraduate studies and the faculty supervisor. The normal minimum requirement is a term paper, but individual faculty members may set alternative equivalent requirements. Only one term may be offered toward the major, with permission of the director of undergraduate studies; two terms may be offered toward the bachelor's degree.

CGSC 4800a, Senior Non-Empirical Project I Isaac Davis
A research colloquium leading to the selection of a topic for the senior essay. This course is followed by CGSC 4810 to complete the senior requirement. Enrollment is limited to Cognitive Science majors earning the B.A. Degree. ½ Course cr

CGSC 4810a, Senior Non-Empirical Project II Isaac Davis
Completion of the senior essay. Prerequisites: CGSC 4800. Enrollment limited to Cognitive Science majors earning the B.A. Degree. ½ Course cr

CGSC 4900a, Senior Empirical Project I Isaac Davis
A research colloquium leading to the selection of a topic for the senior essay. This course is followed by CGSC 4910 to complete the senior requirement. Enrollment is limited to Cognitive Science majors earning the B.S. Degree. ½ Course cr

*** CGSC 4910a, Senior Empirical Project II** Isaac Davis
Completion of the senior essay. Prerequisite: CGSC 4900. Enrollment is limited to Cognitive Science majors earning the B.S. Degree. ½ Course cr

Comparative Literature (LITR)

Computer Science (CPSC)

*** CPSC 0350b / MUSI 0035b, Twenty-First Century Electronic and Computer Music Techniques** Scott Petersen
Exploration of twenty-first century electronic and computer music through the diverse subjects and issues at the intersection of technology and new music. How computers have changed and challenged the analysis, composition, production, and appreciation of music over the last fifty years. Knowledge of basic music theory and the ability to read Western musical notation is assumed. Enrollment limited to first-year students. QR

CPSC 1001a or b, Introduction to Programming Staff
Development on the computer of programming skills, problem-solving methods, and selected applications. No previous experience with computers necessary. QR o Course cr

CPSC 1100a, Python Programming for Humanities and Social Sciences Sohee Park
Introduction to computer science and Python programming with domain-specific applications. Students learn how to think algorithmically and solve problems efficiently. Topics include abstraction, algorithms, data structures, web development, and statistical tools. Students learn to apply computing techniques in the fields of social sciences & humanities by analyzing data. No previous programming experience is required. This course is intended for students of social sciences & humanities majors, but other majors are also welcome. QR o Course cr

CPSC 1230a or b / PLSC 3508a or b / S&DS 1230a or b / S&DS 5230a or b, YData: An Introduction to Data Science Staff
Computational, programming, and statistical skills are no longer optional in our increasingly data-driven world; these skills are essential for opening doors to manifold research and career opportunities. This course aims to dramatically enhance knowledge and capabilities in fundamental ideas and skills in data science, especially computational and programming skills along with inferential thinking. YData is an introduction to Data Science that emphasizes the development of these skills while providing opportunities for hands-on experience and practice. YData is accessible to students with little or no background in computing, programming, or statistics, but is also engaging for more technically oriented students through extensive use of examples and hands-on data analysis. Python 3, a popular and widely used computing language, is the language used in this course. The computing materials will be hosted on a special purpose web server. QR

*** CPSC 1500a, Computer Science and the Modern Intellectual Agenda** David Gelernter
Introduction to the basic ideas of computer science (computability, algorithm, virtual machine, symbol processing system), and of several ongoing relationships between computer science and other fields, particularly philosophy of mind. No previous experience with computers necessary. Enrollment limited to 25. WR, HU

CPSC 1710a, Introduction to AI Applications Xiuye (Sue) Chen
Introduction to AI Applications demystifies the core principles and practical applications of artificial intelligence for students with introductory programming experience. Covering essential topics like machine learning models, data handling, ethical AI use, and real-world problem-solving with AI, this course incorporates hands-on projects to foster an intuitive understanding of AI's capabilities and limitations. Students will emerge from the class with foundational AI knowledge, ready to apply AI solutions across various domains and explore more specialized AI disciplines. CPSC 100 or equivalent introductory programming experience. QR

CPSC 1830a, Law, Technology, and Culture Brad Rosen
An exploration of the myriad ways in which law and technology intersect, with a special focus on the role of cyberspace. Topics include digital copyright, free speech, privacy and anonymity, information security, innovation, online communities, the impact of technology on society, and emerging trends. No previous experience with computers or law necessary. SO

* **CPSC 1840b, Intellectual Property in the Digital Age** Cecillia Xie
The seminar focuses on the evolving and oftentimes vexing intellectual property regime of the new digital age. Topics include copyright, fair use, remix culture, access to knowledge, technological innovations, the increasing relevance of trademarks in the new information society, the tension between creativity/creating and the intellectual property rules which either foster or inhibit it, and the new information culture of the digital age. Prerequisite: CPSC 183 or permission of instructor. HU, SO

* **CPSC 1850b, Control, Privacy, and Technology** Brad Rosen
The evolution of various legal doctrines with and around technological development. Topics include criminal law, privacy, search and seizure, digital rights, and the implications of technologically permitted methods of control on the law. Special attention to case law and policy. After CPSC 183. WR, SO

CPSC 2000a or b, Introduction to Information Systems Stephen Slade
The real-world artifacts and implementations that comprise the vital computational organisms that populate our world. Hardware and software and the related issues of security, privacy, regulation, and software engineering. Examples stress practical applications of technology, as well as limitations and societal issues. After CPSC 100 or 112 or equivalent. QR

CPSC 2010a or b, Introduction to Computer Science Staff
Introduction to the concepts, techniques, and applications of computer science. Topics include computer systems (the design of computers and their languages); theoretical foundations of computing (computability, complexity, algorithm design); and artificial intelligence (the organization of knowledge and its representation for efficient search). Examples stress the importance of different problem-solving methods. After CPSC 100, CPSC 112 or equivalent. QR

CPSC 2020a or b, Mathematical Tools for Computer Science Staff
Introduction to formal methods for reasoning and to mathematical techniques basic to computer science. Topics include propositional logic, discrete mathematics, and linear algebra. Emphasis on applications to computer science: recurrences, sorting, graph traversal, Gaussian elimination. QR 0 Course cr

* **CPSC 2155b / AMST 2255b, Artificial Intelligence, Ethics, and Society** Julian Posada
This seminar examines the development and implementation of artificial intelligence technologies across a broad array of social contexts, incorporating historical, cultural, economic, legal, and political perspectives. The course provides an in-depth study of contemporary AI, from its historical development and varied definitions to current issues, emphasizing the relationship between power dynamics and ethical considerations. After establishing a foundation in theories and the study of ethics and power, the course delves into diverse aspects of AI, including the implications of human labor and material infrastructures in the development of the technology, concerns related to bias and discrimination, and its impacts on the environment. The concluding module applies these discussions to real-world scenarios, exploring how to address ethical and societal issues through legal and human rights frameworks, governance and regulation, and grassroots initiatives. This course is ideal for both computer science and engineering students seeking a socio-humanistic perspective on artificial intelligence, and humanities and social sciences students interested in the societal implications of AI. HU, SO

CPSC 2230a or b, Data Structures and Programming Techniques Staff
Topics include programming in C; data structures (arrays, stacks, queues, lists, trees, heaps, graphs); sorting and searching; storage allocation and management; data abstraction; programming style; testing and debugging; writing efficient programs. After CPSC 2000 or 2010 (formerly CPSC 200 or 201). QR 0 Course cr

* **CPSC 2265a / AMST 2265a, Topics in Critical Computing** Julian Posada and Theodore Kim
This course introduces the social, cultural, and political contexts shaping the contemporary development and use of computing and information technology. Through structured discussions, lectures, and collaborative activities, participants will explore computing's historical evolution, ethical and societal implications, and tangible impacts, including its reliance on transnational infrastructures and environmental effects. Emphasis will be placed on analyzing computer-related social issues through theoretical and critical approaches, empirical research, and governance frameworks, as well as both technical and social strategies for addressing key challenges. The course is designed for students from diverse academic backgrounds across all divisions, aiming to develop a nuanced understanding of computation's intersection with broader social systems and to equip them with tools to engage with critical issues in the rapidly shifting digital landscape. HU, SC

* **CPSC 2800a, Directed Reading** Theodore Kim
Individual study for qualified students who wish to investigate an area of computer science not covered in regular courses. A student must be sponsored by a faculty member who sets the requirements and meets regularly with the student. Requires a written plan of study approved by the faculty adviser and the director of undergraduate studies. May be taken more than once for credit.

* **CPSC 2900a, Directed Research** Theodore Kim
Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. May be taken more than once for credit.

CPSC 3230a or b, Introduction to Systems Programming and Computer Organization
Staff
Machine architecture and computer organization, systems programming in a high-level language, issues in operating systems, software engineering, prototyping in scripting languages. After CPSC 223. QR

CPSC 3270a or b, Object-Oriented Programming Timothy Barron
Object-oriented programming as a means to designing and writing efficient, reliable, modular, and reusable code. Covers core concepts and features of object-oriented languages (classes, inheritance, composition, encapsulation, polymorphism, and exceptions) as well as the use of object-oriented design patterns (iterator, decorator, strategy, adapter, observer, etc.). This course was previously number CPSC 427. After CPSC 223. QR

CPSC 3340a, Creative Embedded Systems Scott Petersen
Ubiquitous computing is creating new canvases and opportunities for creative ideas. This class explores the use of microprocessors, distributed sensor networks, IoT, and intermedia systems for the purposes of creative expression. The course is delivered in a mixed lecture and lab format that introduces the fundamental concepts and theory behind embedded systems as well as issues particular to their creative employment. The key objective of the course is for students to conceive of and implement creative uses of computation. To this end, skills to be obtained during the course are as follows: (1) appreciate the current efforts and motivation to push the limitations of computation for creative expression, both in new application and new foundational research; (2) weigh factors such as cost, power, processing, memory, I/O capabilities, and networking capabilities when choosing a set of embedded devices and sensors; (3) contextualize unfamiliar hardware and languages through examples, documentation, and familiar design pattern; and (4) manage communication between multiple languages, devices, and protocols. Additionally, at the end of the course students will have a portfolio of their work in the form of writing, code, video, audio, and physical artifacts. Prerequisite: CPSC 223 or equivalent or by permission of instructor. QR RP

CPSC 3380b / ECE 3481b, Digital Systems Staff
Development of engineering skills through the design and analysis of digital logic components and circuits. Introduction to gate-level circuit design, beginning with single gates and building up to complex systems. Hands-on experience with circuit design using computer-aided design tools and microcontroller programming. Recommended preparation: EENG 201. QR

CPSC 3650a or b / ECON 3365a or b, Algorithms James Glenn
Paradigms for algorithmic problem solving: greedy algorithms, divide and conquer, dynamic programming, and network flow. NP completeness and approximation algorithms for NP-complete problems. Algorithms for problems from economics, scheduling, network design and navigation, geometry, biology, and optimization. Provides algorithmic background essential to further study of computer science. Only one of CPSC 365 or CPSC 366 may be taken for credit. Prerequisites: CPSC 202 or MATH 244, CPSC 223. QR

*** CPSC 3660b / AMTH 3660b / ECON 3366b, Intensive Algorithms** Anna Gilbert
Mathematically sophisticated treatment of the design and analysis of algorithms and the theory of NP completeness. Algorithmic paradigms including greedy algorithms,

divide and conquer, dynamic programming, network flow, approximation algorithms, and randomized algorithms. Problems drawn from the social sciences, Data Science, Computer Science, and engineering. For students with a flair for proofs and problem solving. Only one of CPSC 365, CPSC 366, or CPSC 368 may be taken for credit. Prerequisites: MATH 244 and CPSC 223. QR

CPSC 3700a, Artificial Intelligence Tesca Fitzgerald
How can we enable computers to make rational, intelligent decisions? This course explores fundamental techniques for Artificial Intelligence (AI), covering topics such as search, planning, learning, and reasoning under uncertainty. Through hands-on programming projects, students learn conceptual, algorithmic, and practical considerations for implementing foundational AI algorithms. By the end of this class, students have an understanding of the history and breadth of AI problems and topics, and are prepared to undertake more advanced courses in robotics, computer vision, natural language processing, and machine learning. Prerequisites: CPSC 202 and CPSC 223. Students should also be familiar with basic object-oriented programming concepts in Python.

CPSC 4130b, Computer System Security Timothy Barron
Overview of the principles and practice behind analyzing, designing, and implementing secure computer systems. Covers problems that have continued to plague computer systems for years as well as recent events and research in this rapidly evolving field of computer science. Learn to think from the perspective of an adversary; to understand systems well enough to see how their flaws could be exploited, and to consequently defend against such exploitation. Offers opportunities for hands-on exploration of attacks and defenses in the contexts of web applications, networks, and system level software. Also discusses ethical considerations and responsibilities associated with security research and practice. After CPSC 323.

CPSC 4150b, Law and Large Language Models Ruzica Piskac and Scott Shapiro
This course is intended for computer science and law students interested in how artificial intelligence can be applied to legal reasoning. It combines basic AI theory with practical project work, focusing on using tools like large language models (LLMs) and other AI technologies for tasks common in legal practice. Students learn how to automate case summarization, draft legal memos and briefs, simulate oral arguments for better argumentation skills, and assist in the preparation of pro-se motions for self-represented litigants. The course emphasizes hands-on experience, helping students build real-world skills in applying AI in legal settings. Our goal is to bring together students from computer science and from law and match them together in the teams. Each team works on a project that automates a specific aspect of the legal process or legal reasoning, focusing on practical, real-world applications. Prerequisites: Basic coding skills, including knowledge of Python; interest in Large Language Models (LLMs); basic understanding of linear algebra and calculus; familiarity with basic probability (e.g., likelihood, averages) and simple statistical concepts (like mean and variance) SO

CPSC 4160a, Lattices and Post-Quantum Cryptography Katerina Sotiraki
This course explores the role of lattices in modern cryptography. In the last decades, novel computational problems, whose hardness is related to lattices, have been instrumental in cryptography by offering: (a) a basis for "post-quantum" cryptography, (b) cryptographic constructions based on worst-case hard problems, (c) numerous

celebrated cryptographic protocols unattainable from other cryptographic assumptions. This course covers the foundations of lattice-based cryptography from fundamental definitions to advanced cryptographic constructions. More precisely, we introduce the Learning with Error (LWE) and the Short Integer Solutions (SIS) problems and study their unique properties, such as the fact that their average-case hardness is based on the worst-case hardness of lattice problems. Next, we cover lattice constructions of advanced cryptographic primitives, such as fully homomorphic encryption and signature schemes. Finally, we introduce some notions of quantum cryptography and explore the role of lattices in this area.#Overall, this course offers insights into the foundations and recent advancements in lattice-based cryptography. Prerequisite: CPSC 467/567 or equivalent and linear algebra

CPSC 4190a or b, Full Stack Web Programming Alan Weide
This course introduces students to a variety of advanced software engineering and programming techniques in the context of full-stack web programming. The focus of the course includes both client- and server-side programming (and database programming), client/server communication, user interface programming, and parallel programming. This course is designed for students who have taken CPSC 223 (but do not need CPSC 323 or higher-level computer science systems courses) and wish to learn the complete programming framework of Web programming. For a systematic treatment of core software engineering techniques, using Web programming as a running example framework, consider taking CPSC 439, which targets students with more extensive programming experiences (after CPSC 323). Prerequisite: CPSC 223

CPSC 4200b / ECE 4201b, Computer Architecture Abhishek Bhattacharjee
This course offers a treatment of computer architectures for high-performance and power/energy-efficient computer systems. Topics include the foundations of general-purpose computing, including instruction set architectures, pipelines, superscalar and out-of-order execution, speculation, support for precise exceptions, and simultaneous multi-threading. We also cover domain-specific hardware (e.g., graphics processing units), and ongoing industry efforts to elevate them to the status of first-class computing units. In tandem, we cover topics relevant to both general-purpose and domain-specific computing, including memory hierarchies, address translation and virtual memory, on-chip networks, machine learning techniques for resource management, and coherence techniques. If time permits, we will study the basics of emerging non-classical computing paradigms like neuromorphic computing. Overall, this course offers insights on how the computing industry is combating the waning of traditional technology scaling via acceleration and heterogeneity. Prerequisites: CPSC 323, 223, and 202. This is a programming-intensive course, so comfort with large programming projects is essential.

* **CPSC 4210a, Compilers and Interpreters** Zhong Shao
Compiler organization and implementation: lexical analysis, formal syntax specification, parsing techniques, execution environment, storage management, code generation and optimization, procedure linkage and address binding. The effect of language-design decisions on compiler construction. After CPSC 323. QR

CPSC 4230b, Design and Implementation of Operating Systems Anurag Khandelwal
The design and implementation of operating systems. Topics include synchronization, deadlock, process management, storage management, file systems, security, protection, and networking. After CPSC 323. QR

CPSC 4240b, Parallel Programming Techniques Quanquan Liu
Practical introduction to parallel programming, emphasizing techniques and algorithms suitable for scientific and engineering computations. Aspects of processor and machine architecture. Techniques such as multithreading, message passing, and data parallel computing using graphics processing units. Performance measurement, tuning, and debugging of parallel programs. Parallel file systems and I/O. Prerequisite: CPSC 323, or CPSC 223 and significant experience with C/C++ programming in another science, social science or engineering discipline, or permission of instructor. QR RP

* **CPSC 4261a, Building AI Infra Systems** Y. Richard Yang
This course covers the design, deployment, operations, and optimization of infrastructure systems that power large-scale modern AI systems such as Large-Language Models (LLMs). It takes an all-resources view, considering AI infrastructure components spanning compute, memory, storage, network, data, and energy resources. Focusing on core AI infrastructure design goals including efficiency, scalability, and stability, the course studies not only the basic mechanisms but also the complete systems to realize the goals. Labs and a capstone project form the core of the course. Prerequisite: CPSC 323, or an equivalent course in systems programming. Background in AI is highly recommended.

CPSC 4270a, C++ Programming for Stability, Security, and Speed Michael Fischer
Computer programming involves both abstraction and practice. Lower-level programming courses focus on learning how to correctly implement algorithms for carrying out a task. This course treats a computer program as an artifact with additional attributes of practical importance including execution efficiency, clarity and readability, redundancy, safety in the face of unexpected or malicious environments, and longevity - the ability to evolve over time as bugs are discovered and requirements change. This course is taught using modern C++. Prerequisite CPSC 223.

CPSC 4310a / MUSI 4228a, Computer Music: Algorithmic and Heuristic Composition Scott Petersen
Study of the theoretical and practical fundamentals of computer-generated music, with a focus on high-level representations of music, algorithmic and heuristic composition, and programming languages for computer music generation. Theoretical concepts are supplemented with pragmatic issues expressed in a high-level programming language. Ability to read music is assumed. After CPSC 202 and 223. QR

CPSC 4320b / MUSI 4227b, Computer Music: Sound Representation and Synthesis Scott Petersen
Study of the theoretical and practical fundamentals of computer-generated music, with a focus on low-level sound representation, acoustics and sound synthesis, scales and tuning systems, and programming languages for computer music generation. Theoretical concepts are supplemented with pragmatic issues expressed in a high-level programming language. Ability to read music is assumed. After CPSC 202 and 223. QR

CPSC 433ob, Computer Networks Y. Richard Yang
An introduction to the design, implementation, analysis, and evaluation of computer networks and their protocols. Topics include layered network architectures, applications, transport, congestion, routing, data link protocols, local area networks, performance analysis, multimedia networking, network security, and network management. Emphasis on protocols used in the Internet. After CPSC 323. QR

CPSC 435ob, Building an Internet Router Robert Soule
Over the course of the semester, students build a fully functioning Internet router. Students design the control plane in Python on a Linux host and design the data plane in the new P4 language on the bmv2 software switch. To provide context and background for the design of their router, students read a selection of papers to get both a historical perspective and exposure to current research in networking. Prerequisite: CPSC 433.

CPSC 437oa, Database Systems Avi Silberschatz
Introduction to database systems. Data modeling. The relational model and the SQL query language. Relational database design, integrity constraints, functional dependencies, and normal forms. Object-oriented databases. Database data structures: files, B-trees, hash indexes. After CPSC 223. QR

* **CPSC 438oa, Big Data Systems: Trends & Challenges** Anurag Khandelwal
Today's internet scale applications and cloud services generate massive amounts of data. At the same time, the availability of inexpensive storage has made it possible for these services and applications to collect and store every piece of data they generate, in the hopes of improving their services by analyzing the collected data. This introduces interesting new opportunities and challenges designing systems for collecting, analyzing and serving the so called "big data". This course looks at technology trends that have paved the way for big data applications, survey state of the art systems for storage and processing of big data, and future research directions driven by open research problems. Our discussions span topics such as cluster architecture, big data analytics stacks, scheduling and resource management, batch and stream analytics, graph processing, ML/AI frameworks, serverless platforms and disaggregated architectures. Prerequisite: CPSC 323.

CPSC 439oa, Software Engineering Timos Antonopoulos
Introduction to fundamental concepts in software engineering and to the development and maintenance of large, robust software systems. The process of collecting requirements and writing specifications; project planning and system design; methods for increasing software reliability, including delta debugging and automatic test-case generation; type systems, static analysis, and model checking. Students build software in teams. After CPSC 323. QR

* **CPSC 439ob, Advanced Software Engineering** Timos Antonopoulos
This course builds on CPSC 439 Software Engineering with a focus on a) building systems that scale well, and b) the technical infrastructure and approaches that would guide or inform entrepreneurship/business decisions. During the whole semester, teams work on a term-length software project of students' design, most often a continuation of the project they worked on during CPSC 4390 or CPSC 5390. After CPSC 4390 or similar. Students will have to have a working product they built during CPSC 4390 or similar course, to further develop during this course. QR

CPSC 4410a, Zero-Knowledge Proofs Ben Fisch
This is a course in cryptographic proof systems. In the digital world today, we trust services to perform many kinds of computations on our data, from managing financial ledgers and databases to complex analytics. We trust these services not only to operate correctly, but also to keep our information private. Proof systems allow us to remove this trust. A succinct proof system is a system that enables a service to attach a small certificate on the correctness of its computation, and the certificate can be verified by small devices, even if the original computation needs substantial computation to compute this result. Beyond correctness, a zero-knowledge proof system enables us to prove knowledge of secret information, including hidden inputs to a computation that achieves a certain output. Both types of proof systems have incredible applications to privacy and verifiability in a decentralized web. Prerequisites: CPSC 201 and 202 (or equivalent, e.g. MATH 244). Recommended: CPSC 467 (Cryptography), MATH 225 (Linear Algebra).

CPSC 4420a, Theory of Computation Dylan McKay
This course first introduces core, traditional ideas from the theory of computation with more modern ideas used in the process, including basic ideas of languages and automata. Building on the core ideas, the course then covers a breadth of topics in modular units, where each unit examines a new model and potentially a new perspective on computation. Topics may include: basic notions of Complexity Theory, provability and logic, circuits and non-uniform computation, randomized computation, quantum computation, query-based computation, notions of machine learning, compression, algebraic models of computation. Additional topics might be introduced in lectures or student projects, according to student interests, including mechanism design, voting schemes, cryptography, biological computation, distributed computation, and pseudorandomness. Prerequisite: one of CPSC 365, 366, or 368 is required. This course is a proof-based theory course and mathematical maturity is expected.

* **CPSC 4440b, Real-World Cryptography** Fan Zhang
Cryptography provides strong security and privacy guarantees in well-defined mathematical models, but applying it to real-world systems is an art—one that must account for performance, cost, evolving adversarial threats, and even user behavior. This course aims to impart the art of designing and applying cryptography in the real world, by examining select advanced cryptographic tools used in practice. Topics include secure channels, identity and credentials, anonymity, end-to-end encrypted messaging, and Trusted Execution Environments (TEEs). Students are expected to be familiar with concepts in computer security and cryptography (e.g., from CPSC 4130, CPSC 4670, or similar courses). To set the stage, we will go over the content of Katz and Lindell (https://www.cs.umd.edu/~jkatz/imc.html) in the first few lectures at a quick pace.

CPSC 4460a, Data and Information Visualization Holly Rushmeier
Visualization is a powerful tool for understanding data and concepts. This course provides an introduction to the concepts needed to build new visualization systems, rather than to use existing visualization software. Major topics are abstracting visualization tasks, using visual channels, spatial arrangements of data, navigation in visualization systems, using multiple views, and filtering and aggregating data. Case

studies to be considered include a wide range of visualization types and applications in humanities, engineering, science, and social science. Prerequiste: CPSC 223.

CPSC 4470a, Introduction to Quantum Computing Yongshan Ding
This course introduces the fundamental concepts in the theory and practice of quantum computation. Topics include information processing, quantum programming, quantum compilation, quantum algorithms, and error correction. The objective of the course is to engage students in applying fresh thinking to what computers can do—we establish an understanding of how quantum computers store and process data, and discover how they differ from conventional digital computers. We anticipate this course will be of interest to students working in computer science, electrical engineering, physics, or mathematics. Prerequisites: CPSC 201 and CPSC 202. Basic familiarity with discrete probability and linear algebra is recommended. Prior experience in quantum computing is useful but not required. SC

CPSC 4490b, Quantum Information Systems Yongshan Ding
Quantum information systems encompass the hardware, software, and networking systems that are designed to encode, store, process, and distribute quantum information. In this course, students get a complete view of such information systems and explore the current advancement associated with building practical quantum computers and networks. This course is structured as four modules: quantum information theory, quantum processor, quantum memory, and quantum network. Prerequisite: CPSC 447 or PHYS 345 or equivalent. This course is intended for advanced undergraduates who are familiar with basic quantum computation and information. We anticipate this course will be of interest to students working in computer science, electrical engineering, or physics. SC

* **CPSC 4510b, The User Interface** David Gelernter
The user interface (UI) in the context of modern design, where tech has been a strong and consistent influence from the Bauhaus and U.S. industrial design of the 1920s and 1930s through the IBM-Eames design project of the 1950s to 1970s. The UI in the context of the windows-menus-mouse desktop, as developed by Alan Kay and Xerox in the 1970s and refined by Apple in the early 1980s. Students develop a detailed design and simple implementation for a UI. Prerequisite: CPSC 223 or equivalent.

CPSC 4520b, Deep Learning Theory and Applications Smita Krishnaswamy
Deep neural networks have gained immense popularity within the last decade due to their success in many important machine learning tasks such as image recognition, speech recognition, and natural language processing. This course provides a principled and hands-on approach to deep learning with neural networks. Students master the principles and practices underlying neural networks including modern methods of deep learning, and apply deep learning methods to real-world problems including image recognition, natural language processing, and biomedical applications. The course is based on homework, a final exam, and a final project (either group or individual, depending on the total number enrolled). The project includes both a written and oral (i.e. presentation) component. The course assumes basic prior knowledge in linear algebra and probability. Prerequisites: CPSC 202 and knowledge of Python Programming.

CPSC 4540a, Software Analysis and Verification Ruzica Piskac
Introduction to concepts, tools, and techniques used in the formal verification of software. State-of-the art tools used for program verification; detailed insights into algorithms and paradigms on which those tools are based, including model checking, abstract interpretation, decision procedures, and SMT solvers. After CPSC 202 and 323 or equivalents. QR RP

CPSC 4550a / ECON 4425a, Algorithmic Game Theory Manolis Zampetakis
A mathematically rigorous investigation of the interplay of economic theory and computer science, with an emphasis on the relationship of incentive-compatibility and algorithmic efficiency. Our main focus is on algorithmic tools in mechanism design, algorithms and complexity theory for learning and computing Nash and market equilibria, and the price of anarchy. Case studies in Web search auctions, wireless spectrum auctions, matching markets, and network routing, and social networks. Prerequisite: CPSC 3650 (formerly CPSC 365) or permission of the instructor. Familiarity with basic microeconomic theory is helpful but not required. QR

CPSC 4580b, Automated Decision Systems Stephen Slade
The spectrum of automated decision models and tools, with a focus on their costs and effectiveness. Examples from a variety of fields, including finance, risk management, robotics, medicine, and politics. After CPSC 223 or equivalents. QR

* **CPSC 4590a, Building Interactive Machines** Marynel Vazquez
This advanced course brings together methods from machine learning, computer vision, robotics, and human-computer interaction to enable interactive machines to perceive and act in a variety of environments. Part of the course examines approaches for perception with different sensing devices and algorithms; the other part focuses on methods for decision making and applied machine learning for control. Understanding of probability, differential calculus, linear algebra, and planning (in Artificial Intelligence) is expected for this course. Programming assignments require proficiency in Python and high-level familiarity with C++. Prerequisites: CPSC 201, CPSC 202, and CPSC 470 (or 570), or permission of the instructor. QR

* **CPSC 4626a, Scalable and Private Graph Algorithms** Quanquan Liu
What techniques can we use to deal with modern real-world data with billions of data points? How do we account for strong adversaries that violate the privacy of users providing this data? This course will provide you with the knowledge to tackle research questions in these domains. We will propose answers and techniques to these broad questions from an algorithmic standpoint, presenting foundational topics such as: 1) The parallel, distributed, and streaming models and algorithmic techniques commonly used within these models 2) Differential privacy and mechanisms for private data analysis 3) Implementation techniques, tools, and examples that demonstrate the practicality of these algorithms in real-world systems. This course focuses on advanced topics in practical graph algorithms with provable guarantees beyond the sequential model used in most introductory algorithms classes. Specific topics include local graph techniques for problems such as maximal matching, independent set, k-core decomposition, densest subgraphs, and coloring as well as global techniques for problems like connectivity, shortest paths, and spanners. Introductory lectures will also feature techniques used beyond graph algorithms. Students are asked to read and present influential recent research papers on these topics. Papers come from prominent CS theory conferences such as STOC, FOCS, SODA as well as database and data

mining conferences like VLDB, PODS, and WWW. In addition to these presentations, students also work on a final project which may be theoretical or implementation-based. The course will also feature voluntary open problem sections where we discuss (known) practice problems and open-ended research questions related to the topics in this course in a collaborative group setting. Prerequisites: CPSC 2020 and CPSC 3650

CPSC 4630b, Algorithms via Convex Optimization Nisheeth Vishnoi
Convex optimization has played a major role in the recent development of fast algorithms for problems arising in areas such as theoretical computer science, discrete optimization, and machine learning. The goal of this course is to design state-of-the-art algorithms for various classical discrete problems through the use of continuous optimization/sampling. The approach is to first formulate the problem as a continuous (convex) optimization problem, even though the problem is over a discrete domain, adapt or develop deterministic or randomized continuous-time dynamical systems to solve it, and then design algorithms for the problem via appropriate discretizations. The algorithmic applications include maximum flow in graphs, maximum matching in bipartite graphs, linear programming, submodular function minimization, and counting problems involving discrete objects such as matroids. We present approaches gradient descent, mirror descent, interior-point methods, and cutting plane methods. A solid background in calculus, linear algebra, probability, and algorithms is recommended. It is intended for students who are comfortable with proofs, who would like to be prepared for graduate school, and who want to improve their problem-solving abilities.

* **CPSC 4640a, Algorithms and their Societal Implications** Nisheeth Vishnoi
Today's society comprises humans living in an interconnected world that is intertwined with a variety of sensing, communicating, and computing devices. Human-generated data is being recorded at unprecedented rates and scales, and powerful AI and ML algorithms, which are capable of learning from such data, are increasingly controlling various aspects of modern society: from social interactions. These data-driven decision-making algorithms have a tremendous potential to change our lives for the better, but, via the ability to mimic and nudge human behavior, they also have the potential to be discriminatory, reinforce societal prejudices, violate privacy, polarize opinions, and influence democratic processes. Thus, designing effective tools to govern modern society which reinforce its cherished values such as equity, justice, democracy, health, privacy, etc. has become paramount and requires a foundational understanding of how humans, data, and algorithms interact. This course is for students who would like to understand and address some of the key challenges and emerging topics at the aforementioned interplay between computation and society. On the one hand, we study human decision-making processes and view them through the lens of computation and on the other hand we study and address the limitations of artificial decision-making algorithms when deployed in various societal contexts. The focus is on developing solutions through a combination of foundational work such as coming up with the right definitions, modeling, algorithms, and empirical evaluation. The current focus is on bias and privacy, with additional topics including robustness, polarization, and democratic representation. Solid mathematical and programming background is necessary to enroll in this course. CPSC 365 and S&DS 251 are recommended.

CPSC 465o b, Theory of Distributed Systems James Aspnes
Models of asynchronous distributed computing systems. Fundamental concepts of concurrency and synchronization, communication, reliability, topological and geometric constraints, time and space complexity, and distributed algorithms. After CPSC 365 or 366. QR

CPSC 466o b, Web3, Blockchains, and Cryptocurrencies Ben Fisch
This course is an introduction to blockchain systems, such as Bitcoin and Ethereum. We begin with a brief history of blockchains and an overview of how they are being used today before launching into foundational topics, including distributed consensus, smart contracts, cryptographic building blocks from signatures to authenticated datastructures, and the economics of blockchains. We then cover advanced topics including the scalability and interoperability of blockchain systems and applications such as "decentralized finance" (DeFi). The lectures and assignments engage students in both theoretical and applied aspects of blockchain systems. The course assumes background in various fundamental areas of CS, including discrete math, probability, algorithms, data structures, and networks. Required: CPSC 202 and 223 (or equivalent). Recommended: CPSC 467 (Cryptography). QR

CPSC 467o a, Introduction to Cryptography Charalampos Papamanthou
This class introduces modern symmetric and public-key cryptography as well as their broad applications, both from a theoretical and practical perspective. There is an initial emphasis on fundamental cryptographic primitives (e.g., block ciphers, pseudorandom functions, pseudorandom generators, one-way functions), their concrete efficiency and implementation as well as their security definitions and proofs. Ways of combining such primitives that lead to more complex objects used to secure today's internet (e.g., via TLS), such as key exchange, randomized encryption, message authentication codes and digital signatures are also studied. The last part of the class is devoted to modern and more advanced applications of cryptography (some of which are deployed at scale today), such as authenticated data structures, zero-knowledge proofs, oblivious RAM, private information retrieval, secret sharing, distributed consensus and cryptocurrencies (e.g, Bitcoin). Some programming may be required. After CPSC 202 or MATH 244, and CPSC 223. QR

* **CPSC 467 1b, Advanced Topics in Cryptography: Cryptography and Computation** Charalampos Papamanthou
Traditional cryptography is mostly concerned with studying the foundations of securing communication via, for example, encryption and message authentication codes. This class studies the applications of cryptography in securing *computation*. Topics include, but are not limited to, fundamental results and the most recent progress in oblivious computation and private information retrieval (PIR), zero-knowledge proofs, secure computation, consensus algorithms, searchable encryption, and lattice-based cryptography. The class focuses both on theory and applications. Prerequisite: CPSC 467o or equivalent. This course assumes prior knowledge of fundamental notions in cryptography and mathematical maturity as well as comfort with programming.

CPSC 468o b, Computational Complexity Dylan McKay
Introduction to the theory of computational complexity. Basic complexity classes, including polynomial time, nondeterministic polynomial time, probabilistic polynomial time, polynomial space, logarithmic space, and nondeterministic logarithmic space. The

roles of reductions, completeness, randomness, and interaction in the formal study of computation. After CPSC 365 or 366, or with permission of instructor. QR

CPSC 4690a, Randomized Algorithms James Aspnes
A study of randomized algorithms from several areas: graph algorithms, algorithms in algebra, approximate counting, probabilistically checkable proofs, and matrix algorithms. Topics include an introduction to tools from probability theory, including some inequalities such as Chernoff bounds. After CPSC 365 or 366; a solid background in probability is desirable. QR

CPSC 4710a, Trustworthy Deep Learning Rex Ying
In recent years, deep learning has seen applications in many fields, from science and technology, to finance, humanity, and businesses. However, real-world, high-impact machine learning applications demand more than just model performance. In particular, deep learning models are often required to be "trustworthy," so that domain experts can trust that the models consistently behave in a way that corresponds to their domain knowledge. For example, medical experts would expect a deep learning diagnosis model to be able to explicitly utilize medical domain knowledge in its prediction; an insurance company would expect a decision on insurance price to be explainable in terms of risk factors; a financial company would expect its fraud detection model to be robust to adversarial attacks; a physicist would expect models to provide consistency with the underlying laws. This course introduces various fields of trustworthy deep learning, including model robustness, defenses for adversarial attacks, interpretability, explainability, fairness, privacy, domain adaptation, rules, and constraints. The course covers some of these aspects in the context of graph neural networks but also covers many other ML models in general deep learning, natural language processing, and computer vision. Prerequisites: a course in linear algebra and multi-variable calculus. Familiarity with PyTorch and other common Python libraries such as Numpy, Sklearn. Deep learning courses such as CPSC 452 or 453 are recommended.

CPSC 4740a, Computational Intelligence for Games James Glenn
Introduction to techniques used for creating computer players for games, particularly board games. Topics include combinatorial and classical game theory, stochastic search methods, applications of neural networks, and procedural content generation. Prerequisites: CPSC 202 and CPSC 223. QR

CPSC 4750a / BENG 4475a / ECE 4750, Computational Vision and Biological Perception Steven Zucker
An overview of computational vision with a biological emphasis. Suitable as an introduction to biological perception for computer science and engineering students, as well as an introduction to computational vision for mathematics, psychology, and physiology students. Prerequisite: CPSC 112 and MATH 120, or with permission of instructor. QR, SC RP

CPSC 4770b, Natural Language Processing Arman Cohan
This course provides a deep dive into modern Natural Language Processing (NLP), with a strong focus on Language Modeling. The curriculum spans both foundational concepts and cutting-edge developments in the field. The course begins with core neural network concepts in NLP, covering word embeddings, sequence modeling, and attention mechanisms. Building on these foundations, we explore transformer

architectures and their evolution, including early transformer language models like BERT, GPT and T5. The course examines how these models enable sophisticated language understanding and generation through pre-training and transfer learning. The latter portion covers contemporary advances: Large Language Models (LLMs), multi-modal integration, parameter-efficient fine-tuning, evaluation, multi-agent systems, reasoning, and model compression. We'll analyze the capabilities and limitations of current systems while discussing emerging research directions. Prerequisites: CPSC 202 and CPSC 223, or permission of instructor. QR

CPSC 478ob, Computer Graphics Theodore Kim
Introduction to the basic concepts of two- and three-dimensional computer graphics. Topics include affine and projective transformations, clipping and windowing, visual perception, scene modeling and animation, algorithms for visible surface determination, reflection models, illumination algorithms, and color theory. After CPSC 202 and 223. QR

*** CPSC 479ob, Advanced Topics in Computer Graphics** Julie Dorsey
An in-depth study of advanced algorithms and systems for rendering, modeling, and animation in computer graphics. Topics vary and may include reflectance modeling, global illumination, subdivision surfaces, NURBS, physically-based fluids systems, and character animation. After CPSC 202 and 223. QR

CPSC 4791a, Building Game Engines Michael Shah
This course teaches the fundamentals of building a reusable software architecture by building games. This is a programming intensive course where the end product of this course is a data-driven game engine that students work in small teams to implement in a systems programming language (e.g. C, C++, D, etc.). Students apply data structures, algorithms, and systems programming skills in the domain of games. Discussion and implementation of the components of a game engine may include: resource management (allocators, resource managers, serialization), abstraction (design patterns, game objects, scripting, graphics layers), graphics management algorithms (scene graphs, level of detail), physics (linear algebra, collision detection and resolution algorithms), artificial intelligence (e.g. pathfinding,decision making), and performance (concurrency, parallelism, math). Students work on a final course project for their portfolio. Prerequisites: CPSC 2230 and CPSC 3230

CPSC 4792b, Real-Time 3D Computer Graphics Programming Michael Shah
This course teaches the fundamentals of real-time 3D computer graphics programming using a systems programming language (e.g. C, C++, D, etc.). Students interested in making 3D games, virtual reality applications, simulations, medical visualizations, and other interactive applications are the target audience. Throughout the course students will also learn about co-processors (e.g. GPUs) for hardware accelerated graphics, and program in a graphics API enabling hardware accelerated graphics. Students will apply a sampling of mathematics in the domain of geometry, trigonometry, linear algebra, and calculus in order to generate photo and non-photorealistic images in real-time. Additional topics may include: geometry processing, scene organization, texturing techniques, advanced lighting techniques, compute shaders, and topics in performance. Prerequisite: either CPSC 411 or CPSC 478.

CPSC 4800a, Introduction to Computer Vision Alex Wong
This course focuses on fundamental topics in computer vision. We begin with the image formation process and discuss the role of camera models and intrinsic calibration in perspective projection. Basic image processing techniques (i.e. filtering) is introduced. After which, we discuss techniques to describe an image, from edges to feature descriptors and methods to establish correspondences between different images of the same scene. The course additionally covers topics in recognition (i.e. image classification, segmentation, detection, etc.) and reconstruction (i.e. stereo, structure-from-motion, optical flow). Machine learning and deep learning based methods in a subset of the topics covered are also introduced. Students get hands-on experience in implementing the techniques covered in the class and applying them to real world datasets and applications. Students taking this course must have successfully passed courses in data structures and object-oriented programming (e.g. CPSC 223a or equivalent courses), and foundational mathematical tools such as discrete math and linear algebra (e.g. CPSC 202 or equivalent courses). It is recommended that students have taken or successfully passed calculus (e.g. MATH 112, MATH 115, MATH 120, or equivalent courses), and linear algebra (e.g. MATH 225, or equivalent courses). A background in statistics, machine learning and deep learning is useful, but not required. Experience in programming with Python is preferable, as we use it for assignments and projects. Familiarity with Google Colab, and numerical and image processing packages (i.e. NumPy, SciPy, and Sci-kit Image) is helpful throughout the course.

CPSC 4830b, Deep Learning on Graph-Structured Data Rex Ying
Graph structure emerges in many important domain applications, including but not limited to computer vision, natural sciences, social networks, languages and knowledge graphs. This course offers an introduction to deep learning algorithms applied to such graph-structured data. The first part of the course is an introduction to representation learning for graphs, and covers common techniques in the field, including distributed node embeddings, graph neural networks, deep graph generative models and non-Euclidean embeddings. The first part also touches upon topics of real-world significance, including auto-ML and explainability for graph learning. The second part of the course covers important applications of graph machine learning. We learn ways to model data as graphs and apply graph learning techniques to problems in domains including online recommender systems, knowledge graphs, biological networks, physical simulations and graph mining. The course covers many deep techniques (graph neural networks, graph deep generative models) catered to graph structures. We will cover basic deep learning tutorials in this course. Prerequisites: CPSC 201, CPSC 223, and one of CPSC 365 or CPSC 366. Knowledge of graphs as a data structure, and understanding of basic graph algorithms are essential for applying machine learning to graph-structured data. Familiarity with Python and important libraries such as Numpy and Pandas are helpful. CPSC 452 and CPSC 453 are highly recommended prior because they cover the foundations of deep neural networks. Experience in machine Learning courses such as CPSC 481, and Graph Theory courses such as CPSC 462 are welcomed as well. QR

CPSC 4840b, Introduction to Human-Computer Interaction Marynel Vazquez
This course introduces students to the interdisciplinary field of Human-Computer Interaction (HCI), with particular focus on Human-Robot Interaction (HRI). The first part of the course covers principles and techniques in the design, development,

and evaluation of interactive systems. It provides students with an introduction to UX Design and User-Centered Research. The second part focuses on the emergent field of HRI and several other non-traditional interfaces, e.g., AR/VR, tangibles, crowdsourcing. The course is organized as a series of lectures, presentations, a mid-term exam, and a semester-long group project on designing a new interactive system. After CPSC 201 and 202 or equivalents. Students who do not fit this profile may be allowed to enroll with the permission of the instructor. SO

CPSC 4850a, Applied Planning and Optimization Daniel Rakita
This course introduces students to concepts, algorithms, and programming techniques pertaining to planning and optimization. At a high level, the course teaches students how to break down a particular problem into a state-space or a state-action space, how to select an effective planning or optimization algorithm given the problem at hand, and how to ultimately apply the selected algorithm to achieve desired outputs. Concepts are solidified through grounded, real-world examples (particularly in robotics, but also including machine learning, graphics, biology, etc.). These examples come in the form of programming assignments, problem sets, and a final project. General topics include discrete planning, sampling-based path planning, optimization via matrix methods, linear programming, computational differentiation, non-linear optimization, and mixed integer programming. After the course, students are able to generalize their knowledge of planning and optimization to any problem domain. Knowledge of linear algebra and calculus is expected. Students should be familiar with matrix multiplication, derivatives, and gradients. QR

CPSC 4870b, 3D Spatial Modeling and Computing Daniel Rakita
Several areas of computer science and related fields must model and compute how objects are situated in three-dimensional space over time, such as robotics, computer vision, computer graphics, computational physics, computational biology, aerospace engineering, and so on. This course teaches students how to computationally model the spatial configuration of and spatial relationships between objects over time. Topics include various methods for representing spatial configurations and transformations (such as transformation matrices, Euler angles, unit quaternions, dual quaternions, etc.), hierarchical chaining of spatial transformations, derivatives of spatial representations concerning time, computing intersections and penetration depths between objects in space, interpolating over spatial representations (such as using splines), signal processing over spatial transformations, optimizing over spatial representations, and more. After CPSC 202 and CPSC 223. All students should have proficiency in programming with mathematical reasoning. Background in linear algebra and calculus is recommended but not required.

* **CPSC 4890b, Robot Learning** Tesca Fitzgerald
This class explores methods for grounding machine learning algorithms in embodied, interactive robots. We cover topics including learning from demonstration, active learning, inverse reinforcement learning, representations for modeling high-level and low-level task information, and human factors for designing learning interactions. Students are asked to read and present research papers on these topics from top publication venues in AI, machine learning, robotics, and human-robot interaction. Students also complete lab assignments in which they implement and evaluate state-of-the-art methods for interactive robot learning on a physical robot arm. Required: CPSC 370/470/570 or an equivalent AI course (requires approval by instructor).

Recommended: An introductory Machine Learning course such as S&DS 265/365 or CPSC 381/481.

* **CPSC 490oa or b, Senior Project** Sohee Park
Individual research intended to fulfill the senior requirement. Requires a faculty supervisor and the permission of the director of undergraduate studies. The student must submit a written report about the results of the project.

Computer Science and Economics (CSEC)

CSEC 491oa or b, Senior Project Philipp Strack
This one-term independent-project course explicitly combines both techniques and subject matter from computer science and economics. A project proposal must be approved by the DUS and project adviser by the end of the third week of the term in which the student is enrolled.

Computing and the Arts (CPAR)

Czech (CZEC)

CZEC 1100a, Elementary Czech I Staff
This course aims to develop basic proficiency in understanding, reading, speaking and writing the Czech language. Through work with a textbook, workbook, audio files and a broad range of authentic printed and online Czech language materials, students should develop mastery of the most essential vocabulary and grammatical structures necessary for basic communication in Czech and for laying a solid foundation for further study of the language. Students should reach out to sci-cls@yale.edu if they have questions about the course. L1 RP 1½ Course cr

CZEC 1200b, Elementary Czech II Staff
Continuation of CZEC 110. This course aims to expand basic proficiency in understanding, reading, speaking, and writing the Czech language. The course works through a selection of dialogues, texts and exercises to develop mastery of the most essential idiomatic vocabulary and grammatical structures necessary for basic communication in Czech and for laying a solid foundation for further study of the language. Prerequisite: CZEC 110 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L2 RP 1½ Course cr

CZEC 1300a, Intermediate Czech I Staff
This course aims to develop intermediate proficiency in understanding, reading, speaking, and writing the Czech language. Through work with a textbook, workbook, audio files, and a broad range of authentic printed and online Czech language materials, students build their active vocabulary and improve their control of Czech grammar and syntax so they can communicate effectively on a broad range of general topics. Students should reach out to sci-cls@yale.edu with any questions. Prerequisite: CZEC 120, or equivalent. L3 RP 1½ Course cr

CZEC 1400b, Intermediate Czech II Staff
This course aims to expand basic proficiency in understanding, reading, speaking, and writing the Czech language. The course works through a selection of dialogues, texts, and exercises to develop mastery of the most essential idiomatic vocabulary and grammatical structures necessary for basic communication in Czech and for laying a solid foundation for further study of the language. Prerequisite: CZEC 130 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L4 RP 1½ Course cr

The DeVane Lecture Course (DEVN)

See Yale Course Search for DEVN 200, Can It Happen Again? Yale, Slavery, the Civil War, and Their Legacies, taught by Professor David Blight.

Directed Studies (DRST)

Dutch (DUTC)

* **DUTC 1300a, Intermediate Dutch I** Staff
Continued development of reading, writing, and speaking proficiency in Dutch. Students review and improve grammar skills, expand their vocabulary, read newspaper articles, and watch and listen to Dutch newscasts. Prerequisite: DUTC 120 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L3 RP 1½ Course cr

DUTC 1400b, Intermediate Dutch II Staff
Use of authentic Dutch texts to expand proficiency in the language and familiarity with the culture. Focus on Dutch cultural themes that reflect students' interests and fields of study. Readings include a novel and news articles on current events. Prerequisite: DUTC 130. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L4 RP 1½ Course cr

* **DUTC 1500a, Advanced Dutch** Staff
Continuation of DUTC 140. Focus on improvement of grammatical knowledge; proficiency in reading, writing, and speaking Dutch; and cultural insight and knowledge of Amsterdam and the Netherlands. Prerequisite: DUTC 140 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L5 RP

Earth and Planetary Sciences (EPS)

* **EPS 0300a, Mass Extinctions** Lidya Tarhan
Mass extinctions have repeatedly reshaped life in the oceans and on land over our planet's history. These extinctions, although all massive, have ranged widely in magnitude, and were followed by different tempos and modes of ecosystem recovery. This course explores historical conceptualization and recent investigations of mass

extinctions. We interrogate potential drivers—and the tools used to diagnose them—of some of Earth's most severe extinctions, including the emergence of new species and new behaviors, meteorite impacts, volcanism, the configuration of tectonic plates, global warming and glaciation. Drawing upon a combination of scientific literature, popular science and works of fiction, we also discuss whether we are in the midst of a sixth mass extinction and explore predicted and imagined post-extinction landscapes. Enrollment limited to first-year students. WR, SC

* **EPS 0800b / APHY 0800b and APHY 1000b / ENAS 0800b / EVST 0080b and EVST 1000b / PHYS 0800b and PHYS 1000b, Energy, Environment, and Public Policy** Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non–science majors with strong backgrounds in math and science. Tours are be conducted of major examples of good energy design at Yale, including the Yale Power Plant and Kroon Hall. Students who take this course are not eligible to take APHY 100. Prerequisites: High school chemistry, physics, and Math. Calculus is not required. Enrollment limited to first-year students. QR, SC

EPS 1010a, Climate Change Noah Planavsky

An introductory course that explores the science of global climate change. We analyze processes that regulate the climate on Earth, assess the scientific evidence for global warming, and discuss consequences of climate change. We explore Earth's climate history as it relates to the present climate as well as future climate projections. Uncertainty in the interpretation of climate observations and future projections are examined. SC

* **EPS 1020b, Understanding Climate Change Solutions** Staff

This seminar explores the scientific, technological, economic, and social aspects of potential solutions to global climate change. We briefly survey the full range of possible solutions, including emissions reduction, mitigation, and adaptation, but focus on understanding mitigation approaches such as carbon dioxide removal at a deeper level. We explore the scientific underpinnings, technological and societal challenges, economics, potential risks and co-benefits, and commercialization pathways of various climate change mitigation solutions. In addition, we quantify the enormous scale required to meaningfully address climate change and place this effort into historical context. SC

* **EPS 1050b / APHY 1000b / ENAS 1000 / EVST 1000b / PHYS 1000b, Energy, Environment, and Public Policy** Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non–science majors with strong backgrounds in math and science. QR, SC RP

EPS 1100a, Dynamic Earth David Evans

An introduction to the Earth as a planetary system, from its atmosphere to its core; and how the constantly changing surface environment controls both the foundation and fate of industrial society. Topics include planetary structure; plate tectonics, earthquakes and volcanoes; minerals, rocks and soils; evolution of landscapes; hydrology and floods; coasts and oceans; climate and weather; Earth history and biological evolution;

humanity's economic dependence on natural resources; and human influences on the natural environment. SC

EPS 1110Lb, Dynamic Earth Laboratory and Field Methods David Evans
Practical exercises in the laboratory and in the field to complement EPS 110 or 115. Identification of minerals and rocks; construction of geologic maps and cross sections to determine Earth-system processes and histories. Includes a field trip to the northern Appalachians during the October recess. After or concurrently with EPS 1100. SC
½ Course cr

EPS 1260Lb, Laboratory for the History of Life Derek Briggs, Pincelli Hull, and Bhart-Anjan Bhullar
A survey of the diversification of life using suites of fossils and related modern organisms drawn from critical evolutionary stages. Emphasis on direct observation and description of specimens, the solution of problems posed by the instructor, and the generation and testing of hypotheses by the students. To be taken concurrently with or following EPS 1250. SC ½ Course cr

EPS 1400b, Atmosphere, Ocean, and Climate Change Juan Lora
Physical processes that control Earth's atmosphere, ocean, and climate. Quantitative methods for constructing energy and water budgets. Topics include clouds, rain, severe storms, regional climate, the ozone layer, air pollution, ocean currents and productivity, the seasons, El Niño, the history of Earth's climate, global warming, energy, and water resources. QR, SC

* **EPS 2120b, Global Tectonics** Mark Brandon
The course provides an overview of the theory of plate tectonics, which accounts for the long-term evolution of the rigid exterior of the earth, and the formation and distribution of oceans, continents, mountain belts, volcanoes, and earthquakes at the earth's surface. The course emphasizes the interdisciplinary approaches used to study the interactions between the mantle, crust, hydrosphere, atmosphere, and biosphere. EPS 110 Dynamic Earth is recommended (but not required) as a prerequisite. SC

EPS 2200b, Mineralogy Jay Ague
Study of the structures, chemistry, and physical properties of minerals, including common rock-forming minerals found in sedimentary, metamorphic, and igneous rocks, as well as rare and valuable minerals such as precious metals and gemstones. Recommended preparation: Introductory chemistry. SC

EPS 2320b, Earth Surface Processes Lidya Tarhan
Introduction to sedimentary rocks as paleoenvironmental archives. Reconstruction of depositional environments and paleoclimatic and paleoecological conditions using sedimentological tools. Topics include sedimentology and stratigraphy and an introduction to how 'reading' the sedimentary record can be used to infer Earth's environmental, biological, climatic, chemical and tectonic history Prerequisite: EPS 0100, 1100 or 1250 or permission of the instructor. SC

* **EPS 2400b, Forensic Geoscience** Maureen Long
Approaches and technologies developed for geoscience that have been adapted and applied in criminal, environmental, historical, and archaeological investigations. Methods related to seismology, geophysics, geomorphology, geochemistry, and radiometric dating. Case studies include nuclear treaty verification, detection of unexploded ordnance and clandestine graves, military history, soil and groundwater

contamination, archaeological controversies, art and antiquities fraud, and narcotics provenance. SC

EPS 2740a, Fossil Fuels and World Energy Staff
The origins, geologic settings, exploration, distribution, and extraction of coal, oil, and natural gas as finite Earth resources. The role of fossil fuels in the world's energy systems; environmental impacts of fossil fuels, including climate change; the transition to low-carbon energy sources. Prerequisites: high school chemistry, mathematics, and Earth science. Recommended preparation: EPS 1100 or 2050. SC

EPS 3100a, Isotope Geochemistry Alan Rooney and Jordan Wostbrock
An overview of the fundamental principles of stable and radiogenic isotope geochemistry. Emphasis is placed on applications of such systems to the evolution of the planet and life on Earth. Specific topics include marine geochemistry, geochronology, and biogeochemistry. Prerequisites: CHEM1650 or with permission of instructor. QR, SC

EPS 3120a, Structural Geology Staff
An introduction to the origin and structure of the lithosphere and continental and oceanic crust. Topics include what controls the solid versus fluid behavior of rocks during deformation, and what controls the character and motion of tectonic plates. Laboratory exercises and field trips. QR, SC 0 Course cr

EPS 3220a, Physics of Weather and Climate Juan Lora
The climatic system; survey of atmospheric behavior and climatic change; meteorological measurements and analysis; formulation of physical principles governing weather and climate with selected applications to small- and large-scale phenomena. After PHYS 1810 and MATH 1200 or equivalents. QR, SC

EPS 3250a, Vertebrate Paleontology Jacques Gauthier
Phylogeny and evolution of the major clades of vertebrates from Cambrian to Recent, as inferred mainly from the fossilized remains of the musculoskeletal system (cranial, axial, and appendicular skeletons). Special attention given to the evolution of vertebrate feeding, locomotor, and sensory systems. Prerequisite: E&EB 225, or with permission of instructor. SC 1½ Course cr

EPS 3260a, Introduction to Earth and Planetary Physics Shun-ichiro Karato
An introduction to the structure and dynamics of Earth and other planets in the context of cosmic evolution. Review of basic physical principles and their applications to geophysics and planetary physics. Star formation and nucleosynthesis; planetary accretion and the birth of the solar system; heat flow, plate tectonics, and mantle dynamics; seismology and geodesy; core dynamics, geomagnetism, and planetary magnetism. Prerequisites: PHYS 1810 and MATH 1200 or equivalents. QR, SC

EPS 3350a, Physical Oceanography Alexey Fedorov
An introduction to ocean dynamics and physical processes controlling large-scale ocean circulation, the Gulf Stream, wind-driven waves, tsunamis, tides, coastal upwelling, and other phenomena. Modern observational, theoretical, and numerical techniques used to study the ocean. The ocean's role in climate and global climate change. After PHYS 1810 and MATH 1200 or equivalents, or with permission of instructor. QR, SC

* **EPS 3360b / ANTH 3136b / ARCG 3136b, Geoarchaeology** Ellery Frahm
A survey of the numerous ways in which theories, approaches, techniques, and data from the earth and environmental sciences are used to address archaeological research questions. A range of interfaces between archaeology and the geological sciences are considered. Topics include stratigraphy, geomorphology, site formation processes, climate reconstruction, site location, and dating techniques. Prior introductory coursework in archaeology or geology (or instructor permission) suggested. SC, SO

EPS 3420a / PHYS 3420a, Introduction to Earth and Environmental Physics John Wettlaufer
A broad introduction to the processes that affect the past, present, and future features of the Earth. Examples include climate and climate change and anthropogenic activities underlying them, planetary history, and their relation to our understanding of Earth's present dynamics and thermodynamics. Prerequisite: PHYS 1700, 1710, or 1800, 1810, or 2000, 2010, or 2600, 2610, MATH 1200, 2460, or ENAS 1940, or permission of instructor. QR, SC

* **EPS 3450a, Paleoecology** Pincelli Hull
How organisms have interacted with one another and the environment has changed dramatically through the history of life. The species and ecosystems we see today, with their myriad interactions and influences, are in many ways very unusual in a historical context. What's more, the evolution of ecosystems has profoundly shaped and driven the evolution of species and the earth system over billions of years. For students of (macro)evolution, geobiology, paleontology, and earth system science, a foundation in paleoecology is essential for understanding the dynamics and drivers of these interrelated systems. To this end, this course is designed to provide students with i) a basic literacy in core concepts of paleoecology, ii) deeper insights into a few major topics, and iii) basic analytical methods with which to ask and answer novel questions of the fossil record. Prerequisite: EPS 1250, BIOL 1040, or permission of the instructor. SC

EPS 3550a, Extraordinary Glimpses of Past Life Derek Briggs
Study of exceptionally well-preserved fossil deposits (*lagerstaetten*) that contain nonmineralized animal skeletons and casts of the soft parts of organisms. Examples such as the Burgess Shale and Solnhofen limestones; what they can reveal about the history and evolution of life, ancient lifestyles and environments, and preservational processes. SC

EPS 4210b, Geophysical Fluid Dynamics Mary-Louise Timmermans
An examination of the equations governing rotating stratified flows with application to atmospheres and oceans. Mathematical models are used to illustrate the dynamical principles of geophysical fluid phenomena such as waves, boundary layers, flow stability, and large-scale circulations. Concepts are investigated through laboratory experiments in a rotating water tank. Prerequisites: Familiarity with differential equations and introductory fluid mechanics, or permission of the instructor. QR, SC

* **EPS 4900a and EPS 4910b, Research and Senior Thesis** Pincelli Hull
Two terms of independent library, laboratory, field, or modeling-based research under faculty supervision. To register for this course, each student must submit a written plan of study, approved by a faculty adviser, to the director of undergraduate studies by the start of the senior year. The plan requires approval of the full EPS faculty.

*** EPS 4920a or b, The Senior Essay** Pincelli Hull
One term of independent library, laboratory, field, or modeling-based research under faculty supervision. To register for this course, each student must submit a written plan of study, approved by a faculty adviser, to the director of undergraduate studies at the beginning of the term in which the essay is to be written.

East Asian Languages and Literatures (EALL)

*** EALL 0100a, The Story of the Stone (or The Dream of the Red Chamber)** Tina Lu
We read together in translation the entirety of the 120-chapter novel, arguably the most celebrated fiction in Chinese. Students learn about the novel's eighteenth-century context and its publication history. We visit the Yale University Art Gallery to look at and handle objects much like those described in the novel. We also visit the Beinecke to see early copies of the novel. This class is an introduction to Chinese and literary studies. Enrollment limited to first-year students. HU

*** EALL 0200a / CPLT 0310a / EALL 020 / HUMS 0240a, Six Global Perspectives on Poetry** Lucas Bender
This first-year seminar in the Six Global Perspectives series offers an introduction to college-level Humanities courses. We read six poems that are considered among the greatest in their very different cultural traditions. By filling in how each of these traditions understood the art of poetry, we consider the ways that verse, across cultures and historical eras, has allowed authors to navigate the challenging relationship between the universal and the particular. We make extensive use of Yale's rich manuscript archives, historical object collections, and art galleries, and we devote sustained attention to improving academic writing skills. Friday lab sessions alternate between writing workshops and field trips to Yale collections. Enrollment limited to first-year students. Students enroll concurrently with HUMS 0299, Six Global Perspectives Lab. WR, HU

EALL 2000a / CHNS 2000a / EAST 2202a / HUMS 4527a, The Chinese Tradition Staff
An introduction to the literature, culture, and thought of premodern China, from the beginnings of the written record to the turn of the twentieth century. Close study of textual and visual primary sources, with attention to their historical and cultural backdrops. Students enrolled in CHNS 200 join a weekly Mandarin-language discussion section. No knowledge of Chinese required for students enrolled in EALL 200. Students enrolled in CHNS 200 must have L5 proficiency in Mandarin or permission of the course instructor. HU 0 Course cr

EALL 2190b / EAST 2201b / HUMS 214b / PHIL 1119b / RLST 171b, Introduction to Chinese Philosophy Lucas Bender
This course represents an introduction to the most important philosophical thinkers and texts in Chinese history, ranging from roughly 500 BC–1500 AD. Topics include ethics, political philosophy, epistemology, and ontology. We discuss the basic works of Confucian and Daoist philosophers during the Warring States and early imperial eras, the continuation of these traditions in early medieval "dark learning," Buddhist philosophy (in its original Indian context, the early period of its spread to China, and in mature Chinese Buddhist schools such as Chan/Zen), and Neo-Confucian philosophy. The course emphasizes readings in the original texts of the thinkers and traditions in

question (all in English translation). No knowledge of Chinese or previous contact with Chinese philosophy required. HU o Course cr

EALL 2560b / CPLT 2650b / EAST 2221b / GLBL 2251b / HUMS 2720b, China in the World Jing Tsu
Recent headlines about China in the world, deciphered in both modern and historical contexts. Interpretation of new events and diverse texts through transnational connections. Topics include China's international relations and global footprint, language and script, Chinese America, science and technology, and science fiction. Special topic for AY 2025–2026 with guest speakers: AI, U.S.-China futurism, and tech policy Readings and discussion in English. HU o Course cr

* **EALL 2670a, Japan's Global Modernisms: 1880-1980** Rosa van Hensbergen
This course is an introduction to Japanese literature from the 1880s to 1980s. Our reading is guided by a different "ism" each week, from 19th-century eroticism and exoticism, through mid-century cosmopolitanism and colonialism, to second-wave feminism and existentialism in the wake of World War II. These distinct moments in the development of Japanese modernism (modanizumu) are shaped by encounters with foreign cultures, and by the importing of foreign ideas and vogues. All the same, we question—along with modernist writer Yū Ryūtanji—the "critique that says modanizumu is nothing more than the latest display of imported cosmetics" (1930). We seek to develop a correspondingly nuanced picture of the specific and changing ways in which Japan understood and figured its relationship to the rest of the world through the course of a century. All readings are in translation, however there is opportunity to read short stories in the original language. HU

* **EALL 2850b / EAST 4221b, 100 Years of Japanese Pop Literature** Luciana Sanga
We cover a variety of genres, from historical fiction to light novels, and authors ranging from Edogawa Rampo to Murakami Haruki. We analyze these works against the literary and socio-historical context of Japan and consider questions of canon formation, literary taste and value(s), and the concept of genre. Occasionally we discuss highbrow or canonical texts and interrogate the validity of the highbrow/popular distinction. All texts are available in English, no prior knowledge of Japanese or Japan is needed. HU

* **EALL 2860b / EAST 4222b, Reading and Translating Modern Japanese Literature** Luciana Sanga
In this class, we read Natsume Sōseki's canonical 1908 novel Sanshirō in its original Japanese. One of the most beloved works of modern Japanese literature, Sanshirō features an eponymous protagonist struggling to navigate college life, love, and friendship. I provide vocabulary lists as well as the historical background necessary to understanding the text, with a focus on its format as a newspaper serialization. Students are expected to come to class having carefully read the assigned chapter. We translate selected passages into English and discuss the text in the context of its initial publication venue and beyond. Students gain a deep understanding of this Japanese classic and become more aware of some recurrent challenges in translating Japanese into English. Prerequisite: third year Japanese or equivalent. Graduate students from any discipline who wish to take the class should email the instructor. HU

* **EALL 3000a / EAST 3222a, Sinological Methods** Pauline Lin
A research course designed for graduate and advanced undergraduate students working on early, imperial or modern China in preparation for their theses. Students use their own research topic as a focus to explore and utilize the wealth of primary sources and tools available in China, Japan, and the West. As a group, we learn about the history of Chinese book collecting, classification of knowledge, the compilation of the encyclopedia Gujin tushu jicheng and the canon Siku quanshu, as well as the darker aspects of censorship from ancient times to the present. For native speakers of Chinese, the course includes secondary literature in English and instruction in professional writing in English about China. Other topics include Chinese bibliographies, bibliophiles' notes, specialized dictionaries, maps and geographical gazetteers, textual editions, genealogies and biographical sources, archaeological and visual materials, major Chinese encyclopedias, compendia, and databases, and evaluating variations and reliability, The course is supplemented by materials from the Beinecke rare books collection. Prerequisite: CHNS 171 or equivalent. Formerly CHNS 202. HU

* **EALL 4700a or b and EALL 4710a or b, Independent Tutorial** Rosa van Hensbergen
For students with advanced Chinese, Japanese, or Korean language skills who wish to engage in concentrated reading and research on literary works in a manner not otherwise offered in courses. The work must be supervised by a specialist and must terminate in a term paper or its equivalent. Ordinarily only one term may be offered toward the major or for credit toward the degree. Permission to enroll requires submission of a detailed project proposal by the end of the first week of classes and its approval by the director of undergraduate studies.

* **EALL 4910a or b, Senior Essay** Rosa van Hensbergen
Preparation of a one-term senior essay under faculty supervision.

* **EALL 4920a or b and EALL 4930a or b, Yearlong Senior Essay** Rosa van Hensbergen
Preparation of a two-term senior essay under faculty supervision. Credit for EALL 492 only on completion of EALL 493.

East Asian Studies (EAST)

EAST 2201b / EALL 2190b / HUMS 214b / PHIL 1119b / RLST 171b, Introduction to Chinese Philosophy Lucas Bender
This course represents an introduction to the most important philosophical thinkers and texts in Chinese history, ranging from roughly 500 BC–1500 AD. Topics include ethics, political philosophy, epistemology, and ontology. We discuss the basic works of Confucian and Daoist philosophers during the Warring States and early imperial eras, the continuation of these traditions in early medieval "dark learning," Buddhist philosophy (in its original Indian context, the early period of its spread to China, and in mature Chinese Buddhist schools such as Chan/Zen), and Neo-Confucian philosophy. The course emphasizes readings in the original texts of the thinkers and traditions in question (all in English translation). No knowledge of Chinese or previous contact with Chinese philosophy required. HU 0 Course cr

EAST 2202a / CHNS 2000a / EALL 2000a / HUMS 4527a, The Chinese Tradition Staff
An introduction to the literature, culture, and thought of premodern China, from the beginnings of the written record to the turn of the twentieth century. Close study of textual and visual primary sources, with attention to their historical and cultural backdrops. Students enrolled in CHNS 200 join a weekly Mandarin-language discussion section. No knowledge of Chinese required for students enrolled in EALL 200. Students enrolled in CHNS 200 must have L5 proficiency in Mandarin or permission of the course instructor. HU 0 Course cr

EAST 2221b / CPLT 2650b / EALL 2560b / GLBL 2251b / HUMS 2720b, China in the World Jing Tsu
Recent headlines about China in the world, deciphered in both modern and historical contexts. Interpretation of new events and diverse texts through transnational connections. Topics include China's international relations and global footprint, language and script, Chinese America, science and technology, and science fiction. Special topic for AY 2025–2026 with guest speakers: AI, U.S.-China futurism, and tech policy Readings and discussion in English. HU 0 Course cr

EAST 2301a / HIST 1421a, China from Present to Past Staff
Underlying causes of current issues facing China traced back to their origins in the premodern period. Topics include economic development, corruption, environmental crises, gender, and Pacific island disputes. Selected primary-source readings in English, images, videos, and Web resources. Preference given to first years and sophomores. WR, HU 0 Course cr

EAST 2321b / HIST 304b, The History of Modern China, 1911-2025 George Remisovsky
An introduction to modern Chinese history spanning from the fall of the Qing Empire to the present. Examines the factors that led to the end of China's dynastic system, the political and social divisions that emerged after the Qing Dynasty's collapse, and the various alternative visions for China's future that have arisen from the late nineteenth century onward. Focuses on aspects of political, economic, and social history. HU 0 Course cr

EAST 2403a / HSAR 3305a, Time in Chinese Art Staff
This class explores the theme of "time" in Chinese art from the traditional to the contemporary period. Drawing upon scholarship on Chinese philosophical understanding of time and clockworks, this course explores how art made manifest notions of the future, past, and present, the passage of time, *ksana*, aeons, eternity and deadlines. This class also investigates manipulations of time—how the unique format, artistic ideas and medium and materials of Chinese art helped to pause, rewind, compress and shorten time. Observing such temporalities, we analyze narrative murals and handscrolls, "this life" v. afterlife in funeral art, paintings of immortality, the significance of bronze corrosion in antiquarianism, uses of the past in traditional Chinese painting and contemporary art, the future and agelessness in movies and digital art, the materiality and nostalgia of old photography and time-based artworks, as well as the history of People's Republic of China as presented at the Tian'anmen Square. HU 0 Course cr

* **EAST 3122a / ANTH 4824a / ANTH 5824a, Politics of Memory** Yukiko Koga
This course explores the role of memory as a social, cultural, and political force in contemporary society. How societies remember difficult pasts has become a contested site for negotiating the present. Through the lens of memory, we examine complex roles that our relationships to difficult pasts play in navigating issues we face today. This course explores this politics of memory that takes place in the realm of popular culture and public space. The class asks such questions as: How do you represent difficult and contested pasts? What does it mean to enable long-silenced victims' voices to be heard? What are the consequences of re-narrating the past by highlighting past injuries and trauma? Does memory work heal or open wounds of a society and a nation? Through examples drawn from the Holocaust, the atomic bombing in Hiroshima, the Vietnam War, genocide in Indonesia and massacres in Lebanon, to debates on confederacy statues, slavery, and lynching in the US, this course approaches these questions through an anthropological exploration of concepts such as memory, trauma, mourning, silence, voice, testimony, and victimhood. HU, SO

* **EAST 3222a / EALL 3000a, Sinological Methods** Pauline Lin
A research course designed for graduate and advanced undergraduate students working on early, imperial or modern China in preparation for their theses. Students use their own research topic as a focus to explore and utilize the wealth of primary sources and tools available in China, Japan, and the West. As a group, we learn about the history of Chinese book collecting, classification of knowledge, the compilation of the encyclopedia Gujin tushu jicheng and the canon Siku quanshu, as well as the darker aspects of censorship from ancient times to the present. For native speakers of Chinese, the course includes secondary literature in English and instruction in professional writing in English about China. Other topics include Chinese bibliographies, bibliophiles' notes, specialized dictionaries, maps and geographical gazetteers, textual editions, genealogies and biographical sources, archaeological and visual materials, major Chinese encyclopedias, compendia, and databases, and evaluating variations and reliability, The course is supplemented by materials from the Beinecke rare books collection. Prerequisite: CHNS 171 or equivalent. Formerly CHNS 202. HU

* **EAST 3401a / HSAR 4449a, Nanban Art: Japan's Artistic Encounter with Early Modern Europe** Mimi Yiengpruksawan
Exploratory and investigative in nature, this seminar is conceived as a baseline engagement with the intersections of art, religion, science, commerce, war, and diplomacy at Kyoto and Nagasaki in the age of Japanese, Chinese, Portuguese, Spanish, Dutch, and English political and mercantile interaction in the sixteenth and seventeenth centuries. It addresses a set of themes whose point of entry is the entangled character of visual production and reception in Japan at a tipping point in the emergence of global modernity, when what were called the Nanbans—"Southern Barbarians," i.e. Europeans—began to arrive in Japan. The question of whether or not much-theorized nomenclatures such as *baroque*, *rococo*, *mestizo*, and even *global modernity* are pertinent to analysis from the Japanese and Asian perspective constitutes the backbone of the course and its primary objective in the study of a corpus of visual materials spanning the European and Asian cultural spheres. As such the seminar is not only about Japan, per se, or about Japanese objects, or the shogunal eye. It is equally about how Japan and Japanese objects and materials, along with objects and materials from other places, figured in a greater community of exchange, friction, confrontation, conquest, and

adaptation in times when Portuguese marauders, Jesuit missionaries, Muslim traders, and Japanese pirates found themselves in the same waters, on ships laden with goods, making landfall in the domains of Japan's great military hegemons. HU

* **EAST 4101b / ANTH 4101b / ARCG 4101b, Archaeological Plant Remains from East Asia and Beyond** Staff

Archaeology asks who we are, and how did humanity get to where it is today. This course explores the subfield of archaeobotany that is dedicated to understanding the same questions through the analysis of plant remains from archaeological sites. Students gain foundational knowledge of archaeobotanical methods, the kinds of plant remain studied, and key research themes including climate and ecology, subsistence economies, plant domestication and spread, and non-food plant uses. There is a long history of research on archaeological plant remains in East Asia. We examine how ancient peoples interacted with their environments mainly through macro plant evidence, i.e. seeds and fruits. We discuss the social impact of choices people made about different kinds of domesticated and wild plants for foods and for production of objects for daily life. The course also highlights contemporary advancements in theories and methodologies within the discipline, supported by case studies from around the globe, with a particular emphasis on East Asia. SO

* **EAST 4120b / ANTH 4120b, Islam and Communist Modernities in Central Asia and Xinjiang** Staff

In the early 20th century, Central Asia and Xinjiang—two Muslim-majority regions with a shared history—fell under the rule of two communist states, the USSR and China. Both states facilitated the emergence of local nations while launching aggressive secularization policies aimed at suppressing local Islamic beliefs and practices. This course takes a comparative approach to the interwoven trajectories of Islam, nation-building, and secularization in Central Asia and Xinjiang. In so doing, it pursues two overarching objectives. The first is to trace the major historical events that have shaped these regions since the late 19th century. The second is to examine the main theoretical frameworks scholars have employed to better understand these historical transformations. Key conceptual questions explored in this course include: What is nationalism and how did Central Asian nations emerge? What is Islam as an object of scholarly inquiry? What is secularism, and how does it shape and regulate religion? How did Soviet and Chinese secularization campaigns transfigure Islam in Central Asia and Xinjiang? What forces facilitate the ongoing ethnocide of the Uyghurs in Xinjiang? HU

* **EAST 4121a / ANTH 4121a, Asian Foodways in the "Anthropocene"** Staff

Together with other creatures on the earth, we have formed food chains. In the "Anthropocene," people have discovered food, improved it, and lived with it. The rich and varied definitions of food have also enabled humans, the animal at the top of the food chains, to create many new ones. Food enters and becomes a part of the human body; in other words, the food we consume has become ourselves. How we define food also determines the way in which we relate to other living beings. We will explore cultural practices of food chains in East Asian societies, with a focus on China, Japan, and South Korea. class will guide students to think about the origins, production, and creation of food, as well as the politics, ethics, and technologies that are intertwined with the circulation of food. By reading ethnographies of food, this class provides students with the theoretical and methodological means to observe and analyze perhaps

the most common thing in life. Food is not just a static object, but part of the global food chains that are constantly circulating, and part of the circulation with the human body. SO

* **EAST 4122a / ANTH 4122a, The Rise of Biosovereignty: Biopolitics, Technology, and Governance** Staff

This seminar critically explores the concept of "biosovereignty"—a framework of ideas and practices through which the state safeguards and utilizes biological resources—to examine how East Asian countries have conceptualized and governed "life" through science and technology. Through this seminar, the goal is to develop a critical understanding of "biosovereignty" and to use the concept to analyze how East Asian states have perceived "life" and "life forms" as assets and properties, as well as to discuss the stakes and implications of their biosovereignty practices. Themes such as the genetic makeup of crops, traditional medicines, seed wars, stem cells, pandemics, and human DNA inform our discussions. We also discuss how international political organizations envision biosovereignty through international treaties and projects. SO

* **EAST 4221b / EALL 2850b, 100 Years of Japanese Pop Literature** Luciana Sanga

We cover a variety of genres, from historical fiction to light novels, and authors ranging from Edogawa Rampo to Murakami Haruki. We analyze these works against the literary and socio-historical context of Japan and consider questions of canon formation, literary taste and value(s), and the concept of genre. Occasionally we discuss highbrow or canonical texts and interrogate the validity of the highbrow/popular distinction. All texts are available in English, no prior knowledge of Japanese or Japan is needed. HU

* **EAST 4222b / EALL 2860b, Reading and Translating Modern Japanese Literature** Luciana Sanga

In this class, we read Natsume Sōseki's canonical 1908 novel Sanshirō in its original Japanese. One of the most beloved works of modern Japanese literature, Sanshirō features an eponymous protagonist struggling to navigate college life, love, and friendship. I provide vocabulary lists as well as the historical background necessary to understanding the text, with a focus on its format as a newspaper serialization. Students are expected to come to class having carefully read the assigned chapter. We translate selected passages into English and discuss the text in the context of its initial publication venue and beyond. Students gain a deep understanding of this Japanese classic and become more aware of some recurrent challenges in translating Japanese into English. Prerequisite: third year Japanese or equivalent. Graduate students from any discipline who wish to take the class should email the instructor. HU

* **EAST 4301a / HIST 2443a, Environmental History of Japan (1600 to the present)** Staff

This course explores Japanese concepts of nature and the environment from the Tokugawa period to the present. Split into three modules, we consider how the Japanese government and society have responded to environmental change, degradation, and destruction. The first module—Tokugawa Nature (1600–1868)—examines shifts in agriculture and forestry, urbanization, and the emergence of scholarly knowledge of the natural world. The second module—Modern Transformation (1868–1945)—focuses on Japan's rapid industrialization, disaster preparedness, and imperial expansion, tracing the environmental consequences of these processes on both the archipelago and East Asia. The third module—Postwar

Developmentalism (1946–present)—addresses industrial pollution diseases, the Fukushima nuclear disaster, and the environmental struggles related to the American military bases in Okinawa. HU

* **EAST 4322a / HIST 2464a, Law and Society in East Asia, 1600-Present** George Remisovsky

What have been the primary concerns of lawmakers in China, Japan, and Korea throughout history? Were their ideas primarily shaped by "Confucian" ideas or by other, more material concerns? How did the public try to make the legal system work for them? This seminar explores these questions in three parts. Part I examines the structure of the Tang legal system and how it shaped the institutions of both Japan and Korea. Part II focuses on case studies from the seventeenth through nineteenth centuries, showing how these legal systems operated in areas ranging from land disputes to violent acts of revenge. Part III then looks at some of the dramatic changes that began in the late 19th century, as foreign imperial pressure impelled their transition to Western-style laws and court systems. HU

* **EAST 4401b / HSAR 4393b, The Transcultural Life of Things: Case Studies from East Asia** Staff

From production to circulation and consumption, the life of an artifact often unfolds across multiple geographic locations and varied environments. The movement of things in space and time offers valuable insights into the waxing and waning of maritime and terrestrial networks that fostered transregional connectivity. This course introduces students to a variety of objects from premodern East Asia with a view to understanding the histories of intercultural exchange inscribed into their designs, materials, and itineraries. It begins by familiarizing students with methodologies, interpretive frameworks, and critical vocabulary for studying interconnected material cultures. The rest of the course is organized as a series of case studies on specific object types and structured into four modules, each focusing on a different sphere of exchange defined by shared geography, trade, religion, or ecosystem. Through this diverse group of objects, we will explore the entanglement of material culture with evolving structures of power, networks of interregional and long-distance exchange, and the physical environment in East Asia. HU

* **EAST 4520b / PLSC 3133b, Chinese Thinking on International Relations** Feng Zhang

How have the Chinese thought about international relations and their country's role in the world? How has such thinking influenced China's foreign relations past and present? This advanced seminar canvasses Chinese thinking on international relations from the imperial epoch to the present, focusing on the post-1949 era of the People's Republic of China. It is structured around three core engagements: the historical background of Chinese thinking; policy thinking of the successive PRC leaderships; and new strands of thinking at present. It examines both the evolutionary process of thinking and a body of prominent ideas and doctrines. Throughout the course, students have the opportunity to place China's foreign policy in a broader and deeper intellectual context than is often the case. SO

* **EAST 4521a / PLSC 3134a, China's International Relations** Feng Zhang

This course examines China's international relations with a focus on both historical context and contemporary developments. Beginning with imperial China's traditional foreign relations and the "century of humiliation," the course traces the evolution of

Chinese foreign policy through the Cold War period to the present day. Students analyze China's relationships with major powers and regions, including the United States, Russia, Northeast Asia, Southeast Asia, and India, while exploring critical issues such as the Taiwan question, territorial disputes in the South China Sea, and China's growing role in global governance. Special attention is paid to understanding the drivers of China's recent assertive turn in foreign policy under Xi Jinping, theories of international relations as applied to China's rise, and the implications of China's increasing power for the international order. Through engagement with scholarly works and contemporary policy debates, the course provides students with a comprehensive understanding of China's foreign relations and its emergence as a global power. SO

*** EAST 4601b / RLST 3430b, Tibetan Buddhism** Staff
This course provides a broad introduction to the intellectual history, philosophy, practices, and culture of Tibetan Buddhism. In this course, we will approach Tibetan Buddhism through four topics: 1) the historical development of Buddhism in Tibet and its key characters, including major gods, goddesses, and human figures; 2) Buddhist ideas about a central theme in nearly all religions: human suffering; 3) ideas and practices that address the problem of human suffering; and 4) the lives of individuals in contemporary Tibetan Buddhist communities. We will we will read and discuss excerpts from Tibetan Buddhist literature; learn to appreciate and analyze Tibetan art and architecture; and watch short documentaries about Tibet that allow us to see how the ideas and practices from the texts connect to peoples' lives today. HU

*** EAST 4602a / RLST 2290a, Buddhist Ethics** Staff
In this course, we will explore ethical issues in Buddhism across a wide range of contexts and time periods. Together, we will examine how Buddhism addresses fundamental moral and ethical questions, such as: How should I behave? What are the implications of my actions? What is good and bad? How can we bridge the gap between knowing what is right and acting accordingly? The course is divided into two parts. In the first part, we will explore foundational topics in Buddhist ethics, focusing on themes such as retribution, precepts, the Bodhisattva's path, meditation, and the role of feelings. The second part centers on Buddhism's responses to contemporary ethical issues, including abortion, gender, race, and environmental ethics. This course integrates both the theory and practice of ethics. The structure and assignments are designed to help you engage with theoretical systems that may differ from those you are familiar with, while also applying these abstract ideas to reflect on the relationship between theory and practice. HU

*** EAST 4620a / RLST 4250a, Korean Religions** Staff
This seminar examines the diverse and dynamic religious traditions of Korea including shamanism, Confucianism, Buddhism, Christianity, and New Religions from the pre-modern developments to religious experience in contemporary Korea including North Korea. This course adopts an interdisciplinary approach by discussing the histories and philosophies of religions, and their roles in Korean culture and society. It also deals with women's position in traditional and contemporary Korean religions. Why study Korean religions? How can we approach Korean religions from an academic perspective? What role have religions played in Korean history, culture, and society? Through a reflection on Korean religions, students are encouraged to think critically about the concept of religion and its role. HU

* **EAST 4890a or b, Independent Study** Lucas Bender
For students with advanced Chinese, Japanese, or Korean language skills who wish to pursue a close study of the East Asia region, not otherwise covered by departmental offerings. May be used for research, a special project, or a substantial research paper under faculty supervision. A term paper or its equivalent and regular meetings with an adviser are required. Ordinarily only one term may be offered toward the major or for credit toward the degree. Permission to enroll requires submission of a detailed project proposal, signed by the adviser, by the end of the first week of classes and its approval by the director of undergraduate studies.

EAST 4900a or b, One-Term Senior Essay Lucas Bender
Preparation of a one-term senior essay under the guidance of a faculty adviser. Students must receive the prior agreement of the director of undergraduate studies and of the faculty member who will serve as the senior essay adviser. Students must arrange to meet with that adviser on a regular basis throughout the term.

* **EAST 4910a and EAST 4920b, Senior Research Project** Lucas Bender
Two-term directed research project under the supervision of a ladder faculty member. Students should write essays using materials in East Asian languages when possible. Essays should be based on primary material, whether in an East Asian language or English. Summary of secondary material is not acceptable. Credit for EAST 491 only on completion of EAST 492. ½ Course cr per term

Ecology & Evolutionary Biology (E&EB)

Economics (ECON)

* **ECON 0002b, Social Issues in America** Rebecca Toseland
This seminar investigates how data and economics can be used to understand and solve some of the most pressing contemporary social issues in the United States. Topics include equality of opportunity, education, health, climate change, criminal justice, and discrimination. In the context of these topics, the course provides an introduction to some basic economic concepts and data analysis techniques. No prior knowledge of economics or statistics is assumed. Enrollment limited to first-year students. SO

* **ECON 1108a, Quantitative Foundations of Microeconomics** Tolga Koker
Introductory microeconomics with a special emphasis on quantitative methods and examples. Intended for students with limited or no experience with calculus. Enrollment limited. May not be taken after ECON 110 or 115. QR, SO

* **ECON 1110a or b, An Introduction to Microeconomic Analysis** Staff
Similar to ECON 115, but taught as a lecture discussion with limited enrollment. Enrollment limited to first-years and sophomores. May not be taken after ECON 108 or 115. QR, SO

* **ECON 1111a or b, An Introduction to Macroeconomic Analysis** Marnix Amand
Similar to ECON 116, but taught as a lecture discussion with limited enrollment. Enrollment limited to first-years and sophomores. May not be taken after ECON 116. Prerequisite: ECON 108, 110, or 115. SO

ECON 1115a or b, Introductory Microeconomics Staff
An introduction to the basic tools of microeconomics to provide a rigorous framework for understanding how individuals, firms, markets, and governments allocate scarce resources. The design and evaluation of public policy. May not be taken after ECON 108 or 110. QR, SO 0 Course cr

ECON 1116a or b, Introductory Macroeconomics Staff
This course is an introduction to macroeconomics. We begin by asking why some countries produce so much more output than others. We investigate the role of savings and investment, research and development, and the economic institutions that determine them. We then ask what determines output, unemployment, inflation, and interest rates over time, why they fluctuate over time, and how policymakers affect them. May not be taken after ECON 111. Prerequisite: ECON 108, 110, or 115. SO 0 Course cr

ECON 1117a or b, Introduction to Data Analysis and Econometrics Staff
Introduction to data analysis from the beginning of the econometrics sequence; exposure to modern empirical economics; and development of credible economic analysis. This course emphasizes working directly and early with data, through such economic examples as studies of environmental/natural resource economics, intergenerational mobility, discrimination, and finance. Topics include: probability, statistics, and sampling; selection, causation and causal inference; regression and model specification; and machine learning and big data. Prerequisites: ECON 108, 110, 115, or equivalent and familiarity with single variable calculus. Students who have taken ECON 131 may not receive major credit for this course. QR, SO 0 Course cr

ECON 2121a or b, Intermediate Microeconomics Staff
The theory of resource allocation and its applications. Topics include the theory of choice, consumer and firm behavior, production, price determination in different market structures, welfare, and market failure. After introductory microeconomics and completion of Math 112 or higher. Elementary techniques from multivariate calculus are introduced and applied, but prior knowledge is not assumed. May not be taken after ECON 125. QR, SO 0 Course cr

ECON 2122a or b, Intermediate Macroeconomics Staff
Contemporary theories of employment, finance, money, business fluctuations, and economic growth. Their implications for monetary and fiscal policy. Emphasis on empirical studies, financial and monetary crises, and recent policies and problems. After two terms of introductory economics and completion of the Math 112 or higher. QR, SO 0 Course cr

ECON 2123a or b, Intermediate Data Analysis and Econometrics Staff
Comprehensive and theoretical examination of econometrics, with further exploration of topics covered in ECON 117. A term research project addresses a research question chosen by the student, and involves the application of learned methods to a relevant data set. Prerequisites: ECON 108, 110, 115, or equivalent; ECON 117; and familiarity with single variable calculus. QR, SO 0 Course cr

ECON 2125a, Microeconomic Theory Staff
Similar to ECON 121 but with a more intensive treatment of consumer and producer theory, and covering additional topics including choice under uncertainty, game theory, contracting under hidden actions or hidden information, externalities and public goods,

and general equilibrium theory. Recommended for students considering graduate study in economics. After introductory economics, and MATH 118 or 120 or equivalent. May not be taken after ECON 121. QR, SO 0 Course cr

* **ECON 2126b, Macroeconomic Theory** Joel Flynn
Similar to ECON 122 but with a more intensive treatment of the mathematical foundations of macroeconomic modeling, and with rigorous study of additional topics. Recommended for students considering graduate study in economics. After two terms of introductory economics, and MATH 118 or 120 or equivalent. QR, SO 0 Course cr

ECON 2135a, Introduction to Probability and Statistics Yusuke Narita
Foundations of mathematical statistics: probability theory, distribution theory, parameter estimation, hypothesis testing, regression, and computer programming. Recommended for students considering graduate study in economics. Prerequisites: Introductory microeconomics and MATH 118 or MATH 120 and MATH 222; or MATH 120 and MATH 225. QR, SO 0 Course cr

ECON 2136b, Econometrics Staff
Continuation of ECON 135 with a focus on econometric theory and practice: problems that arise from the specification, estimation, and interpretation of models of economic behavior. Topics include classical regression and simultaneous equations models; panel data; and limited dependent variables. Recommended for students considering graduate study in economics. Prerequisites: After ECON 135 or STAT 241 and 242. May not be taken concurrently with STAT 242. QR, SO 0 Course cr

* **ECON 2144a, Economics of Artificial Intelligence and Innovation** Evangelia Chalioti
This course studies the economics of innovation and the effects of artificial intelligence on different industries. Topics include economics of the intellectual property (IP) protection system and prizes; strategic choices in innovation & competition; price discrimination; personalizing pricing and bundling; searching costs; online advertising; economics of data; the sharing and digitized economy; legal and social infrastructure. Prerequisites: Introductory Microeconomics or equivalent: Econ 115 or Econ 110 QR, SO

ECON 2159a or b / GLBL 2159a or b, Game Theory Staff
An introduction to game theory and strategic thinking. Ideas such as dominance, backward induction, Nash equilibrium, evolutionary stability, commitment, credibility, asymmetric information, adverse selection, and signaling are applied to games played in class and to examples drawn from economics, politics, the movies, and elsewhere. After introductory microeconomics. No prior knowledge of game theory assumed. QR, SO 0 Course cr

ECON 2160b / GLBL 2383b, Games and Information Staff
This is designed to be a "second" game theory course. We build on the learnings from introductory game theory courses like ECON 159/GLBL 159, MGT 822 or the SOM core. The course aims to introduce important ideas and tools from game theory, and use them to answer questions in social sciences, law, and business. For instance, how does information get sold and used to persuade? How do we think about the efficiency and equity of allocations? How do sellers decide the best format for an auction to sell a good? Does requiring unanimous verdicts guarantee that the innocent will not be

convicted? What causes bank runs? When do we see price wars? The underlying ideas will include games of incomplete information, mechanism design, common knowledge and high-order reasoning, and repeated games. Prerequisite: Any introductory game theory course, e.g., ECON/GLBL 159, MGT 822 or Game Theory in the SOM Core. SO RP 0 Course cr

ECON 2170a, Health Economics and Public Policy Howard Forman
Application of economic principles to the study of the U.S. health care system. Emphasis on basic principles about the structure of the U.S. system, current problems, proposed solutions, and the context of health policy making and politics. After introductory microeconomics. SO

ECON 2171b / AFAM 1946b / EDST 1271b / EDST 271, Urban Inequalities and Educational Inequality Gerald Jaynes
Analysis of contemporary policy problems related to academic under performance in lower income urban schools and the concomitant achievement gaps among various racial and ethnic groups in United States K-12 education. Historical review of opportunity inequalities and policy solutions proposed to ameliorate differences in achievement and job readiness. Students benefit from practical experience and interdisciplinary methods, including a lab component with time spent in a New Haven high school. Prerequisites: Any course offered by Education Studies, or one course in history or any social science, either: Anthropology, Economics, Political Science, Psychology, Sociology. EDST 110 is preferred, although not required. SO

ECON 2184b / GLBL 2234b, International Economics Peter Schott
Introduction to conceptual tools useful for understanding the strategic choices made by countries, firms, and unions in a globalized world. After two terms of introductory economics. SO

* **ECON 2185a / GLBL 3237a, Global Economy** Aleh Tsyvinski
A global view of the world economy and the salient issues in the short and the long run. Economics of crises, fiscal policy, debt, inequality, global imbalances, climate change. The course is based on reading, debating, and applying cutting edge macroeconomic research. SO

ECON 2201b / GLBL 3211b, Introduction to Development Economics Lauren Bergquist
This course explores the causes of global poverty and the efficacy of policies designed to alleviate it. Topics to be covered in this course include poverty and inequality, global health, education, agriculture, savings, insurance, credit markets, labor markets, firm productivity, colonialism, slavery, democracy, and corruption. These topics will be approached through the lens of micro-economics, with a focus on the variety of tools available for rigorously measuring the impact of development policies and programs. *Econ 117 or GLBL 121 (or the equivalent)*. SO

ECON 2210b / EDST 1201b, Economics of Education Daniela Morar
Application of basic economic concepts and empirical methods to the analysis of education. Topics include the economic return to secondary and postsecondary education, the quality of elementary and secondary education, the market for teachers, inequality in education attainment, and school choice. Prerequisites: ECON 108, 110, or 115 and ECON 117. A prior course in statistics or econometrics is helpful but not required. SO

ECON 2224a, Labor Economics William Hawkins
What determines wages? Why is there unemployment? How will artificial intelligence affect workers? This course is an introduction to the economics of the labor market. We cover theoretical models and study real-world data. We aim to understand policies (for example, minimum wages) and institutions (for example, labor unions), their effects, and their advantages and disadvantages. Prerequisite: Introductory Microeconomics (ECON 108, 110, or 115) For some topics, students will benefit from familiarity with ideas covered in a first course in statistics or econometrics (for example, Econ 117), and in introductory macroeconomics (Econ 111 or 116), but neither of these is required. All necessary material from both will be taught without assuming students are familiar with it in any way. SO

ECON 2251a, Financial Economics Staff
Introduction to the economic analysis of investment decisions and financial markets. Topics include time discounting, portfolio choice, equilibrium pricing, arbitrage, market efficiency, equity valuation, fixed-income securities, derivative pricing, and financial intermediation. Prerequisite: Introductory microeconomics. QR, SO
o Course cr

ECON 2265a / HIST 1766a, History of Economic Thought Robert Dimand
The objective of this course is to give an overview of how economic analysis has developed, and an introduction to the varied ways in which some of the great economists of the past have gone about studying how the economy functions. We discuss the relevance of their theories to public policy and the role of the state, and consider the roles of pre-analytic vision, improvements in analytical technique, and external events (such as the Great Depression or Global Financial Crisis) in the development of economic analysis. Prerequisites: ECON 115 and ECON 116. SO

* **ECON 2276b, Global Economic History** Adriana Arroyo Abad
Before 1820, the pace of economic change over a typical lifetime was zero—after 1820, economic growth revolutionized economic life every few decades. What enabled that growth to continue until today and will it continue into the future? In this course we study economic growth from the Middle Ages until today. In particular, we examine the role played by geography, colonization, technology, migration, and international integration. Prerequisite: ECON 116 or ECON 111. SO

ECON 3303b, Technology and Society Pascual Restrepo
This course explores the vast influence of technology on our society and the economy. We discuss how technology originates and evolves and how this process affects our standards of living, trade, the nature of work, the functioning of labor markets, inequality, and social order. Students must be familiar with econometric analysis (ECON 115 or ECON 117) and consumer and producer theory (ECON 110). SO

ECON 3304a, Law and Economics in the Age of Computers William Macleod
This course aims to utilize economic tools to elucidate the fundamental aspects of private law and regulation. The rapid advancement of new technologies in the 21st century necessitates new laws and regulations. Therefore, in addition to traditional law and economics topics, the course explores recent developments in the regulation of new technologies and estimates the causal effect of changes in law on economic performance. The study of legal statutes and regulations provides an opportunity to apply microeconomic tools to substantive policy issues. Price theory, game theory,

agency theory, and models of trade with asymmetric information are among the tools that are utilized. These tools provide a framework for understanding and predicting the consequences of legal changes. The empirical literature reviewed in the course provides estimates on the magnitude of the effects that legal changes have on economic performance and individual well-being. Prerequisites: ECON 121 or ECON 125 and ECON 123 or ECON 135. These are required courses for economics majors. SO

ECON 3326b, Fundamentals of Economic Development Kaivan Munshi
The objective of this course is to examine some of the fundamental forces that shape the process of economic development. This course is divided into three sections: (i) Market Failure: with an analysis of credit, labor, and insurance markets in developing countries. (ii) Social Response: how community networks emerge in response to market failure. We study the positive and negative consequences of this community involvement for growth and development; in the short-run and the long-run. We also provide economic foundations for the emergence of social norms and identity, as well as the dynamic inefficiencies that they can generate with economic development. (iii) Biological Response: how biological adaptation to economic conditions in the pre-modern economy can have negative consequences for nutritional status and health in developing economies. Apart from providing a particular perspective on development, an additional objective of this course demonstrates the use of economic theory in informing empirical research. Prerequisites: Intermediate Microeconomics, Introductory Econometrics and Data Analysis. Students are expected to be familiar with calculus, basic microeconomics, and basic econometrics. SO

ECON 3345a, The Economics of Children & Families Janet Currie
This course provides an overview of the ways that economic thinking and methods can be and have been applied to understanding people's lives from the time before birth through the formation of their own families. Specific topics include determinants of fertility, the fetal origins hypothesis, the importance of child health as a form of human capital, early childhood education, child mental health, K-12 education, college choices and returns to education, partnering decisions, determinants of parental investments in children, and returns to public investments in children. We look at these topics through the lens of how they contribute to human capital formation, human capital being the most important form of capital underlying growth and development. Prerequisites: Intermediate Microeconomics, Introductory Econometrics, and Data Analysis. Students are expected to be familiar with calculus, basic microeconomics, and basic econometrics. SO

ECON 3350a, Mathematical Economics: General Equilibrium Theory John Geanakoplos
An introduction to general equilibrium theory and its application to finance and the theory of money. Recommended for students considering graduate study in economics, or a career in quantitative finance. Prerequisites: After MATH 118 or 120, and intermediate microeconomics. QR, SO 0 Course cr

ECON 3351b, Mathematical Economics: Game Theory Elliot Lipnowski
Introduction to game theory and choice under uncertainty. Analysis of the role of information and uncertainty for individual choice behavior, as well as application to the decision theory under uncertainty. Analysis of strategic interaction among economic agents, leading to the theory of auctions and mechanism design. Recommended

for students considering graduate study in economics. After MATH 118, 120, and intermediate microeconomics. QR, SO 0 Course cr

ECON 3363a, The Global Financial Crisis Andrew Metrick and Timothy Geithner
Comprehensive survey of the causes, events, policy responses, and aftermath of the global financial crisis of 2007–09. Study of the dynamics of financial crises in a modern economy. Prerequisite: Successful completion of a course in introductory economics. SO

ECON 3365a or b / CPSC 3650a or b, Algorithms James Glenn
Paradigms for algorithmic problem solving: greedy algorithms, divide and conquer, dynamic programming, and network flow. NP completeness and approximation algorithms for NP-complete problems. Algorithms for problems from economics, scheduling, network design and navigation, geometry, biology, and optimization. Provides algorithmic background essential to further study of computer science. Only one of CPSC 365 or CPSC 366 may be taken for credit. Prerequisites: CPSC 202 or MATH 244, CPSC 223. QR

* **ECON 3366b / AMTH 3660b / CPSC 3660b, Intensive Algorithms** Anna Gilbert
Mathematically sophisticated treatment of the design and analysis of algorithms and the theory of NP completeness. Algorithmic paradigms including greedy algorithms, divide and conquer, dynamic programming, network flow, approximation algorithms, and randomized algorithms. Problems drawn from the social sciences, Data Science, Computer Science, and engineering. For students with a flair for proofs and problem solving. Only one of CPSC 365, CPSC 366, or CPSC 368 may be taken for credit. Prerequisites: MATH 244 and CPSC 223. QR

ECON 3375b / GLBL 3219b, Monetary Policy William English
Introduction to modern macroeconomic models and how to use the models to examine some of the key issues that have faced monetary policymakers during and after the global financial crisis of 2008–2009. Prerequisites: Intermediate level macroeconomics (ECON 122 or 126) and introductory econometrics. WR, SO 0 Course cr

* **ECON 3426a, Discrimination in Law, Theory, and Practice** Gerald Jaynes
How law and economic theory define and conceptualize economic discrimination; whether economic models adequately describe behaviors of discriminators as documented in court cases and government hearings; the extent to which economic theory and econometric techniques aid our understanding of actual marketplace discrimination. This course was formerly listed as ECON 475. Prerequisites: introductory microeconomics and at least one additional course in Economics, African American Studies, Ethnicity, Race, and Migration, or Women's, Gender, and Sexuality Studies.

* **ECON 4407a / GLBL 4310a, International Finance** Ana Fieler
A study of the implications of increasing integration of the world economy, through international trade, multinational production, and financial markets. Topics include foreign exchange markets, capital flows, trade and current account imbalances, coordination of monetary and fiscal policy in a global economy, financial crises and their links to sovereign debt crises and currency devaluations. Prerequisite: intermediate macroeconomics or equivalent. SO 0 Course cr

ECON 4409b, Firms, Markets, and Competition Philip Haile
Analysis of imperfectly competitive markets, focusing on the interactions among firm behavior, market structure, and market outcomes. Topics include oligopoly, collusion, predation, firm entry, advertising, and price discrimination as well as public policy implications of market behavior. After intermediate microeconomics or equivalent. QR, SO

* **ECON 4411b, Economics of Uncertainty and Information** Soenje Reiche
Individual and collective choice in the presence of uncertainty and asymmetric information. Implications of such decision making for economic phenomena. Basic analytical tools for studying decisions under uncertainty. Asset markets, adverse selection, screening, signaling, moral hazard, incomplete contracts, bilateral trade with asymmetric information, and mechanism design. Prerequisites: intermediate microeconomics and econometrics. SO 0 Course cr

ECON 4419b, Financial Time Series Econometrics Xiaohong Chen
This is an advanced course covers basic univariate and multivariate models and methods used to analyze financial and economic time series data and panel time series data. Topics include: classic linear models; serial dependence, autocorrelation in error variances (ARCH, GARCH); methods that allow for nonlinearity, tail dependence, comovements, conditional value at risk, fat-tails, nonstationarity; vector autoregressive models; factor models; Markov switching, latent factors, measurement errors, stochastic volatility; empirical asset pricing models. The aim of the course is to help students write their senior essays and start their own research in economics and finance. Prerequisites: ECON 117 and 123, or ECON 135 and 136. SO

ECON 4424a / GLBL 4308a, Central Banking William English
Introduction to the different roles and responsibilities of modern central banks, including the operation of payments systems, monetary policy, supervision and regulation, and financial stability. Discussion of different ways to structure central banks to best manage their responsibilities. Prerequisites: Intermediate Microeconomics, Intermediate Macroeconomics, and Introductory Econometrics. SO 0 Course cr

ECON 4425a / CPSC 4550a, Algorithmic Game Theory Manolis Zampetakis
A mathematically rigorous investigation of the interplay of economic theory and computer science, with an emphasis on the relationship of incentive-compatibility and algorithmic efficiency. Our main focus is on algorithmic tools in mechanism design, algorithms and complexity theory for learning and computing Nash and market equilibria, and the price of anarchy. Case studies in Web search auctions, wireless spectrum auctions, matching markets, and network routing, and social networks. Prerequisite: CPSC 3650 (formerly CPSC 365) or permission of the instructor. Familiarity with basic microeconomic theory is helpful but not required. QR

ECON 4433a, The Economics of Space Costas Arkolakis
The aim of this course is to analyze the ways that geography determines economic outcomes. We discuss and analyze data on regional economic activity and how economic shocks propagate in space. We pair those data with simple models where geography plays a crucial role in the determination of economic activity and discuss how changes in this geography lead some regions to grow and economic outcomes to diverge. Various policies that affect the spatial allocation of economic activity, such as

infrastructure investment, local taxes, and transfers, are analyzed Prerequisites: MATH 118, 120, or permission of instructor. SO o Course cr

* **ECON 4434a, Labor Economics: Inequality and Social Mobility** Orazio Attanasio
The objective of this advanced course is to study various aspects of inequality and social mobility and to understand their trends over time and their drivers. Although we briefly study some international comparisons, the focus of the course is inequality in the US and, to a less extent, the UK. We consider inequalities among different countries only tangentially. Prerequisites: ECON 121 and Econometrics. SO

ECON 4438a, Applied Econometrics: Politics, Sports, Microeconomics Ray Fair
This course has an applied econometrics focus. Topics include voting behavior, betting markets, and various issues in sports. The aim of the course is to help students prepare original empirical research using econometric tools and to read empirical papers in economics and other social sciences. Students write three empirical papers. The first can be an extension of an existing article, where some of the results are duplicated and then extended. The second is similar to the first with no example provided. The third is an original paper within the range of topics covered in the course, where data are collected and analyzed using relevant econometric techniques. Prerequisites: Two econometrics or statistics courses, one of which has to be ECON 117. Ideally, ECON 123 should also have been taken, but it is not an absolute requirement. ECON 135 and ECON 136 are substitutes for ECON 117 and ECON 123. Special permission from the instructor is needed if ECON 117 or ECON 136 has not been taken. Also required is introductory microeconomics. SO

ECON 4439b, Applied Econometrics: Macroeconomic and Finance Forecasting Ray Fair
This course has an applied econometrics focus. The focus is on forecasting macroeconomic and financial variables. Macroeconomic forecasting concerns forecasting variables like GDP, components of GDP like consumption, investment, and imports, inflation, the unemployment rate, interest rates, the government deficit, and exchange rates. There are various forecasting methods, some purely statistical time series techniques and some using economic theory. We consider both. Financial forecasting is more problematic, since changes in asset prices may be roughly unpredictable. We also examine topics like momentum forecasting to see if some asset prices are predictable. Prerequisites: Two courses in econometrics or statistics, or one course with special permission from the instructor. SO

* **ECON 4444a, Market Inefficiencies and the Limits of Arbitrage** Michael J Pascutti
The role of hedge funds in the United States financial markets and hedge fund behavior; understanding what hedge funds do, why they exist, and how they are different from other investment vehicles. Study of investment strategies that provide opportunity and risk for investors and study of academic papers analyzing (risky) arbitrage strategies. Prerequisite: intermediate microeconomics and econometrics. SO o Course cr

* **ECON 4445b, The U.S. Banking System** Michael J Pascutti
The special functions of banks in the U.S. economy. The benefits but fragile nature of the banking system. Prerequisites: intermediate macroeconomics, microeconomics, and econometrics. SO

* **ECON 4446a / APHY 4700a, Statistical Methods with Applications in Science and Finance** Sohrab Ismail-Beigi
Introduction to key methods in statistical physics with examples drawn principally from the sciences (physics, chemistry, astronomy, statistics, biology) as well as added examples from finance. Students learn the fundamentals of Monte Carlo, stochastic random walks, and analysis of covariance analytically as well as via numerical exercises. Prerequisites: ENAS 194, MATH 222, and ENAS 130, or equivalents. QR, SC

* **ECON 4450b, Investment Analysis** Alex Hetherington and Chivetta Amelia
This seminar seeks to introduce the world of investment management to students, across a range of investment strategies from public stocks to private equity and real estate. The instructors, both senior members of the Yale Investment Office, the department that manages the University's $41 billion endowment, guide class discussion in response to assigned reading and guest speaker visits. The distinguished guest speakers, including world-renowned hedge fund managers, venture capital luminaries and Yale's chief investment manager Matthew Mendelsohn '07 are at the heart of the course. These speakers join the seminar for a discussion of how their firms approach the investment landscape and how they seek to achieve market-beating returns. Students are asked to engage with and analyze the speaker's investment strategy and to think about the strategy from the perspective of an institutional investor like Yale. Registration requires instructor permission. SO

* **ECON 4455a, Economic Models of New Technology** Evangelia Chalioti
Analysis of firms' incentives to innovate, focusing on the effects of market power on the intensity of innovative activity. Topics include strategic investment in innovation, patent races, the diffusion of knowledge, intellectual property (IP) protection systems, IP licensing, research joint ventures, litigation, venture capital, and conflicts between IP rights and antitrust regulation. Prerequisite: Intermediate Microeconomics or equivalent: Econ 121 or Econ 125 SO

* **ECON 4456a, Private Equity Investing** Michael Schmertzler
A case-oriented study of principal issues and investment types found in substantial private equity portfolios. Discussion of enterprise valuation, value creation, business economics, negotiation, and legal structure, based on primary source materials and original cases. Prerequisite: ECON 251 or ECON 252 or ECON 255. SO

* **ECON 4459a, Experimental Economics** Maria Kogelnik
The goal of this course is to introduce students to the methods of conducting controlled experiments to study economic phenomena. Students learn how to design experimental studies to gain insights into human behavior in economic contexts, and to critically evaluate existing research. The course covers a wide range of economic questions that can be studied using experiments. Experimental methods and their advantages as well as shortcomings are discussed using examples from the recent literature. Furthermore, students are expected to actively participate in incentivized experiments that are administered for learning purposes. SO

* **ECON 4460a / EP&E 4259a, From Say's Law to the Global Financial Crisis: Thinking about Economic Fluctuations and Instability** Robert Dimand
This course investigates the changing ways in which economic fluctuations and financial and economic instability have been analyzed in the two centuries from the debates at the end of the Napoleonic Wars over Say's Law of Markets and the possibility

of a general glut of commodities through to the Global Financial Crisis and the present state of macroeconomics. Prerequisite: Intermediate Macroeconomics (ECON 2122 or ECON 2126) or permission of the instructor. SO

* **ECON 4463b / BENG 4063b, The Economics and Science of Medicine** Gregory Raskin and Yashodhara Dash
This multidisciplinary class is an exploration of the background of today's bestselling medicines, their huge commercial impact, and the companies that created them. It focuses on the most compelling aspects of drug development and company formation in the context of topical issues like cancer treatment, gene editing, stem cell therapy, the opioid epidemic, and drug pricing controversies. Prerequisite: Introductory or intermediate microeconomics, introductory or intermediate Biology, Molecular Biology, Chemistry or Biomedical Engineering. SO

* **ECON 4465a / EP&E 4224a / GLBL 4830a, Debating Globalization** Ernesto Zedillo
Facets of contemporary economic globalization, including trade, investment, and migration. Challenges and threats of globalization: inclusion and inequality, emerging global players, global governance, climate change, and nuclear weapons proliferation. Prerequisite: background in international economics and data analysis. Preference to seniors majoring in Economics or EP&E. SO RP

* **ECON 4467b / ECON 467 / GLBL 4307b, Economic Evolution of the Latin American and Caribbean Countries** Ernesto Zedillo
Economic evolution and prospects of the Latin American and Caribbean (LAC) countries. Topics include the period from independence to the 1930s; import substitution and industrialization to the early 1980s; the debt crisis and the "lost decade"; reform and disappointment in the late 1980s and the 1990s; exploration of selected episodes in particular countries; and speculations about the future. Prerequisities: intermediate microeconomics and macroeconomics. SO

* **ECON 4468b, Institutions and Incentives in Economic Development** Mark Rosenzweig
Assessment of alternative policies and programs designed to promote economic development; examination of fundamental problems of underdeveloped areas and consideration of how and whether such programs resolve them. The roles of indigenous institutions in low-income countries in alleviating problems of underdevelopment. Prerequisites: intermediate microeconomics and econometrics. SO

* **ECON 4470a, Long-term Fiscal Sustainability** Teresa Delgado
The course considers the study of fiscal policy and government finances and its determinants in the long term. We focus on the US and other advanced economies' sustainability position and how that is driven by and related to changes in the demographic structure of these countries, and other age-related expenditures, like health and pensions. The effect of other expenditures, like student loans, and revenues are looked at. We also carry out sovereign debt analysis of some middle-income countries. The pre-requisites are introductory macroeconomics and microeconomics. SO

* **ECON 4482b, Economics of Cities** Cody Cook
This seminar explores the economic forces shaping cities, their structure, and the lives of their residents. Topics include why cities exist, urban amenities & disamenities, housing markets, segregation, transportation infrastructure, and the political economy

of local governments. The course emphasizes both the core theoretical models of urban economics and policy-relevant empirical applications, such as zoning reform, affordable housing programs, congestion pricing, and climate adaptation. Prerequisites: Intermediate micro and econometrics and a working knowledge of calculus and some basic statistics. Problem sets involve some coding and data analysis. SO

* **ECON 4485b / PSYC 3585b, Behavioral Economics** Maria Saez Marti
Study of foundational topics in behavioral economics. Focus on theories of single-agent behavior that aim to incorporate non-standard phenomena into classic economic models, with consideration of intertemporal decision-making, choice under uncertainty, and learning. Prerequisites: ECON 121; some familiarity with game theory and probability theory. SO

* **ECON 4491a and ECON 4492b, The Senior Essay** Staff
The senior essay is an opportunity for a student to engage in independent economic research. The essay should not be merely a review of the literature, but must contain original research and/or analysis aimed at examining a hypothesis using the tools of economics. The essay can be theoretical, empirical or computational. The senior essays that receive A's and are awarded prizes are typically those that use economics tools (and, where appropriate, data) to offer fresh insights on questions. The senior essay is optional, but it is required for consideration for Distinction in the Major (for both Economics and Econ&Math). Students enrolling in this one-term course need to find an advisor. There are no page requirements or formatting requirements. 1 credit for Yale College students Two econometrics courses (or ECON 135 plus one econometrics course). The second econometrics course can be taken Cr/D/F, and can be taken in the fall of senior year. The econometrics courses that qualify are only ECON 117, ECON 123 and ECON 136, in addition to 400-level applied econometrics courses (ECON 419, ECON 438 and ECON 439).

* **ECON 4498a and ECON 4499b, Directed Reading** Giovanni Maggi
Junior and senior economics majors desiring a directed reading course in special topics in economics not covered in other graduate or undergraduate courses may elect this course, not more than once, with written permission of the director of undergraduate studies and of the instructor. The instructor meets with the student regularly, typically for an hour a week, and the student writes a paper or a series of short essays. Junior and senior majors may take this course for a letter grade, but it does not meet the requirement for a department seminar. The application form may be found here: https://economics.yale.edu/undergraduate/forms-documents

Education Studies (EDST)

* **EDST 0165a / EDST 065 / HUMS 0650a, Education and the Life Worth Living** Matthew Croasmun
Consideration of education and what it has to do with real life—not just any life, but a life worth living. Engagement with three visions of different traditions of imagining the good life and of imagining education: Confucianism, Christianity, and Modernism. Students will be asked to challenge the fundamental question of the good life and to put that question at the heart of their college education. Enrollment limited to first-year students. HU

* **EDST 1015a, Literature Seminars** Jill Campbell
Exploration of major themes in selected works of literature. Individual sections focus on topics such as war, justice, childhood, sex and gender, the supernatural, and the natural world. Emphasis on the development of writing skills and the analysis of fiction, poetry, drama, and nonfiction prose. WR, HU

EDST 1110a / AMST 1110a / SOCY 1012a, Foundations in Education Studies Staff
Introduction to key issues and debates in the U.S. public education system with a focus on the nexus of education theory and research, policy and pedagogy. The course emphasizes social, scientific, economic, and political forces that shape approaches to schooling and education reform, and it includes theoretical and practical perspectives from practitioners, policymakers, and scholars. SO 0 Course cr

* **EDST 1125a / CHLD 1250a / PSYC 125 / PSYC 1425a, Child Development** Ann Close and Carla Horwitz
This course is first in a sequence including Theory and Practice of Early Childhood Education (CHLD127/PSYCH 127/EDST 127) and Language Literacy and Play (CHLD 128/PSYCH 128/EDST 128). This course provides students a theoretical base in child development and behavior and tools to sensitively and carefully observer infants and young children. The seminar will consider aspects of cognitive, social, and emotional development. An assumption of this course is that it is not possible to understand children—their behavior and development—without understanding their families and culture and the relationships between children and parents. The course will give an overview of the major theories in the field, focusing on the complex interaction between the developing self and the environment, exploring current research and theory as well as practice. Students will have the opportunity to see how programs for young children use psychodynamic and interactional theories to inform the development of their philosophy and curriculum. Weekly Observations:-Total Time Commitment 3 hours per week. Students will do two separate weekly observations over the course of the semester. They will observe in a group setting for 2 hours each each week at a Yale affiliated child care center. Students will also arrange to do a weekly 1 hour observation (either in person or virtually) of a child under the age of 6. Students must make their own arrangements for these individual observations. If it is not possible to arrange a child to observe, please do not apply to take this course. For a portion of class meetings, the class will divide into small supervisory discussion groups. Priority given to juniors, seniors, Ed Study students. WR, SO

EDST 1144a / EDST 144 / ER&M 2511a / EVST 1144a / EVST 144 / SOCY 1700a, Race, Ethnicity, and Immigration Staff
Exploration of sociological studies and theoretical and empirical analyses of race, ethnicity, and immigration, with focus on race relations and racial and ethnic differences in outcomes in contemporary U.S. society (post-1960s). Study of the patterns of educational and labor market outcomes, incarceration, and family formation of whites, blacks (African Americans), Hispanics, and Asian Americans in the United States, as well as immigration patterns and how they affect race and ethnic relations. SO 0 Course cr

EDST 1160b / PSYC 1500b, Social Psychology Maria Gendron
Theories, methodology, and applications of social psychology. Core topics include the self, social cognition/social perception, attitudes and persuasion, group processes,

conformity, human conflict and aggression, prejudice, prosocial behavior, and emotion. SO

EDST 1177a / AFAM 1398a / CGSC 2770a / PHIL 1177a, Propaganda, Ideology, and Democracy Staff
Historical, philosophical, psychological, and linguistic introduction to the issues and challenges that propaganda raises for liberal democracy. How propaganda can work to undermine democracy; ways in which schools and the press are implicated; the use of propaganda by social movements to address democracy's deficiencies; the legitimacy of propaganda in cases of political crisis. HU o Course cr

EDST 1180a or b / EDST 180 / PSYC 1700a or b, Clinical Psychology Staff
The major forms of psychopathology that appear in childhood and adult life. Topics include the symptomatology of mental disorders; their etiology from psychological, biological, and sociocultural perspectives; and issues pertaining to diagnosis and treatment. SO o Course cr

EDST 1201b / ECON 2210b, Economics of Education Daniela Morar
Application of basic economic concepts and empirical methods to the analysis of education. Topics include the economic return to secondary and postsecondary education, the quality of elementary and secondary education, the market for teachers, inequality in education attainment, and school choice. Prerequisites: ECON 108, 110, or 115 and ECON 117. A prior course in statistics or econometrics is helpful but not required. SO

* **EDST 1235b / AMST 2239 / WGSS 2239b, Education and the Culture Wars** Talya Zemach-Bersin
Examination of the historical development and politics of the "culture wars" with a focus on how battles over the "soul of America" have focused on the American education system. Conflict over "American values" issues like abortion, gay marriage, and religion are compounded by legal battles over federal funding and school choice. Study of interdisciplinary readings from law, politics, history, and cultural studies. EDST 1110 recommended.

EDST 1237a / LING 1179a / PSYC 3317a, Language and Mind Maria Pinango
The structure of linguistic knowledge and how it is used during communication. The principles that guide the acquisition of this system by children learning their first language, by children learning language in unusual circumstances (heritage speakers, sign languages) and adults learning a second language, bilingual speakers. The processing of language in real-time. Psychological traits that impact language learning and language use. SO RP o Course cr

* **EDST 1261b, Colloquium: Readings in Education Studies** Talya Zemach-Bersin
This colloquium, required for all newly admitted Scholar Intensive Certificate students, introduces a range of topics, methods and approaches to education studies, acquainting them with the expertise of faculty teaching in the Education Studies program and their fellow students, and providing them with opportunities for leadership, reflection, and collaboration. While building a cohort community, students will read key texts in the field of education studies and prepare to undertake a capstone in Education Studies. EDST 1110 and acceptance into the Education Studies Scholar Intensive Certificate.

EDST 1271b / AFAM 1946b / ECON 2171b / EDST 271, Urban Inequalities and Educational Inequality Gerald Jaynes
Analysis of contemporary policy problems related to academic under performance in lower income urban schools and the concomitant achievement gaps among various racial and ethnic groups in United States K-12 education. Historical review of opportunity inequalities and policy solutions proposed to ameliorate differences in achievement and job readiness. Students benefit from practical experience and interdisciplinary methods, including a lab component with time spent in a New Haven high school. Prerequisites: Any course offered by Education Studies, or one course in history or any social science, either: Anthropology, Economics, Political Science, Psychology, Sociology. EDST 110 is preferred, although not required. SO

* **EDST 1282a / PLSC 3411a, Comparative International Education** Mira Debs
Around the world, education is one of the central institutions of society, developing the next generation of citizens, workers and individuals. How do countries balance these competing priorities? In which ways do countries converge on policies, or develop novel approaches to education? Through the course, students learn the a) impact of colonialism on contemporary education systems, b) the competing tensions of the demands of citizen and worker and c) how a variety of educational policies are impacted around the world and their impact on diverse populations of students. EDST 1110 recommended. WR, SO

* **EDST 1350b / CHLD 3500b / EDST 350, Autism and Related Disorders** Mariana Torres-Viso, Kelly Powell, and James McPartland
Weekly seminar focusing on autism and related disorders of socialization. A series of lectures on topics in etiology, diagnosis and assessment, treatment and advocacy, and social neuroscience methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, residence, or treatment setting for individuals with autism spectrum disorders. Details about admission to the course are explained at the first course meeting. Prerequisite: an introductory psychology course. SO

* **EDST 1372a / HUMS 3372a / PLSC 3372a, Idolizing Education** Mordechai Levy-Eichel
What is learning? What is education? And why is it so easy to ask, yet so damn hard to answer these questions? Is there something wrong with these queries, with the assumptions we have about them—and what assumptions are those, anyways? This course will be an examination of the history, sociology, politics, and philosophy of education, as well as a critical examination of the scholarly study of education. Although there has probably never been more research into learning and schools, our presuppositions about what education should be have, in fact, narrowed and hardened. This course aims both to break and to refresh them. Examples will range chronologically from ancient to modern times, and will be taken from a broad range of traditions and institutions. Particular attention will be paid to the origins and growth of the research university, and the costs and benefits involved in the modern institutionalization of learning. We will focus on—in the words of a noted, but now neglected Yale psychologist (Seymour Sarason)—how education has, especially in modern western societies like ours, become both "scapegoat and salvation."

* **EDST 1436b / EDST 436 / PSYC 4360b, Translating Developmental Science into Educational Practice** Julia Leonard
Recent insights from developmental psychology and neuroscience on synaptic plasticity, critical periods, metacognition, and enriched environments are ripe for application to improve children's lives. Yet sometimes the translation of research into practice is a bridge too far. In this course, we discuss cutting-edge research in developmental cognitive and neural sciences and examine how these findings can inform policy and educational practice. SO

* **EDST 2209b / AFAM 2339b / AMST 4461b / ER&M 1692b / WGSS 2202b, Identity, Diversity, and Policy in U.S. Education** Craig Canfield
Introduction to critical theory (feminism, queer theory, critical race theory, disability studies, trans studies, Indigenous studies) as a fundamental tool for understanding and critiquing identity, diversity, and policy in U.S. education. Exploration of identity politics and theory, as they figure in education policy. Methods for applying theory and interventions to interrogate issues in education. Application of theory and interventions to policy creation and reform. EDST 1110 recommended. WR, HU

* **EDST 2225a, Child Care, Society, and Public Policy** Janna Wagner and Jessica Sager
Exploration of societal decisions about where children under the age of five spend their days. Topics include where young children belong; how to regulate, pay for, and support child care arrangements; consideration of gender, race, and family finances; and the profound impact of these decisions on the well-being of children, families, and the economy. Assignments draw heavily on student insights and reflections. EDST 1110 recommended. SO

* **EDST 2230b, American Education and the Law** William Garfinkel
Interactions between American elementary and secondary school education and the American legal system, with a focus on historical and contemporary case law. The relationship between schooling and the state; constitutional, statutory, and regulatory law governing the rights and responsibilities of educators, students, and parents; equal educational opportunity. EDST 1110 recommended. SO

* **EDST 2232a / PLSC 3251a, US Federal Education Policy** Eleanor Schiff
Though education policy is typically viewed as a state and local issue, the federal government has taken a significant role in shaping policy since the end of World War II. The centralization of education policy has corresponded with changing views in society for what constitutes an equitable educational opportunity. This class is divided into three topics: 1) the federal role in education broadly (K-12) and the accountability movement in K-12: from the No Child Left Behind Act to the Common Core State Standards (and cross-national comparisons to US schools), 2) federal role in higher education, and 3) the education industry (teachers unions and think tanks). EDST 1110 recommended. SO

* **EDST 2238a / EDST 238 / PLSC 3233a, The Politics of Public Education** Staff
Examination of the deep political divides, past and present, over public education in the United States. Fundamental questions, including who gets to determine where and how children are educated, who should pay for public education, and the role of education as a counter for poverty, remain politically contested. The course explores these conflicts from a variety of political perspectives. Students learn journalistic methods, including narrative, opinion and digital storytelling, developing the necessary

skills to participate in the national conversation around education policy and politics. WR, SO

* **EDST 2245b, Designing and Evaluating Educational Interventions in the Global South** Staff

This course explores how education systems in low- and middle-income countries (LMICs), which support the learning of tens of millions of children, can be strengthened through effective, context-responsive innovations and interventions. We will examine a variety of aspects of education systems—such as teacher training, curriculum, financing, and school leadership—through the lenses of policy reform and innovation. Throughout the course, students will develop policy analysis skills by researching and designing knowledge-based innovations and interventions implemented in local and global contexts. EDST 1110 recommended.

* **EDST 2270b / AMST 4447b / ER&M 3567b, Contemporary Native American K-12 and Postsecondary Educational Policy** Matthew Makomenaw

This course explores Native American educational policy issues, programming, funding, and success. Native American representation in policy conversations is often incomplete, complicated, or relegated to an asterisk resulting in a lack of resources, awareness, and visibility in educational policy. This course examines the challenges and issues related to Native education; however, the impetus of this course centers on the resiliency, strength, and imagination of Native American students and communities to redefine and achieve success in a complex and often unfamiliar educational environment. EDST 1110 recommended. SO

* **EDST 2274b, College in Prison** Zelda Roland

The history, present, and future of higher education in prison seen through the perspective of practitioners, students, alumni, faculty, theorists, and higher ed policymakers. Topics include: prison education and abolition; liberal arts in prison; the history of higher education in the U.S.; the 1994 Pell grant ban for incarcerated students and the restoration of Pell access; citizenship and education; town-gown relationships, reparations, and higher education; the idea of criminality and the idea of studenthood; and the history of the Yale student body. EDST 1110 recommended.

* **EDST 2285b, Educational Design: The Form and Function of Schooling and Learning** Richard Lemons and Leslie Torres-Rodriguez

This course explores the physical, chronological, structural, and curricular design of schools and classrooms that impact the educational community and the development of students. Using organizational theory and design thinking, students learn how to help schools better align to the learning needs of students. This course is especially ideal for students interested in founding their own schools or educational organizations. EDST 1110 recommended. SO

* **EDST 2290a, Leadership, Change, and Improvement in Education** Richard Lemons

Analysis of the most significant challenges faced by the United States educational system, drawing upon research from a range of academic disciplines to understand how schools and districts operate and why certain educational challenges persist, sometimes over multiple generations of students. Students will study successful educational improvement efforts to better understand the political and organizational strategies necessary to improve student experiences and outcomes at scale, as well as

the leadership practices necessary to successfully implement and sustain such strategies. EDST 1110 recommended. SO

* **EDST 3107b / EDST 107 / MB&B 1070b / PHYS 1070b, Being Human in STEM** Staff

A collaboratively designed, project-oriented course that seeks to examine, understand, and disseminate how diversity of gender, race, religion, sexuality, economic circumstances, etc. shape the STEM experience at Yale and nationally, and that seeks to formulate and implement solutions to issues that are identified. Study of relevant peer-reviewed literature and popular-press articles. OpEd writing project and design and implementation of an intervention project focusing on improving belonging in Yale STEM communities. SO

* **EDST 3127b / CHLD 1270b / PSYC 1427b, Theory and Practice of Early Childhood Education** Carla Horwitz

The course deals with development and delivery of curricula for **young children ages 3–6** and the current context of educational reform and debate. Goals are to deepen insights through critical analysis of educational programs for young children in light of current research and developmental theory and to understand how culture and political context contribute to the practice of education. Regularly scheduled seminar discussions and workshops that engage students with learning materials emphasize the ongoing dynamic process of developing emergent curriculum and focus on methods of creating a responsive, inclusive environment; planning and assessment; appreciating cultural and linguistic diversity; teachers' roles; anti-bias education; working with families; conceptualizing the professional challenges of collaborating on a teaching team within the organization of the school; standards and accountability and the role of policy and advocacy in educational change. The course will use newspaper and magazine articles and other recent media as primary sources in addition to current research and other texts. Students must arrange to do a weekly one-hour observation (in-person or virtually) of a child under age 6 and an additional 2 hour in-person classroom observation at Calvin Hill Day Care Center or another Yale-affiliated child care center. Total observation time commitment is 3 hours per week. If you are unable to find a child to observe, please do not register for this class. CHLD 125 is recommended. Permission of instructor is required. Priority given to juniors, seniors, and Ed Study students. WR, SO RP

* **EDST 3128b / CHLD 1280b / PSYC 1428b, Language, Literacy, and Play** Ann Close and Carla Horwitz

The focus of this course will be to demonstrate the complicated role that play has in the development of language and literacy skills. A major part of each topic presentation will be a discussion of the role that play has in the curriculum in enhancing these developmental areas. There is a widespread consensus that play is an essential component of a developmentally appropriate early childhood curriculum. Research indicates that play enhances a child's creativity, intellectual development and social emotional development. Because learning to play, learning language and learning literacy skills are all part of the process of thinking and communication**, the course will provide a view which attempts to demonstrate the integration of language, literacy and play in an early childhood education curriculum.** Theoretical aspects of each of these developmental areas will be examined first, and it will be that theoretical understanding which will be the basis upon which ideas about curriculum will be

explored, experienced and discussed. Students must arrange to do a weekly one-hour observation (in-person or virtually) of a child under age 6 and an additional 2 hour in-person classroom observation at Calvin Hill Day Care Center or another Yale-affiliated child care center. Total observation time commitment is 3 hours per week. If you are unable to find a child to observe, please do not register for this class. Permission of instructor. Enrollment priority will be given to juniors, seniors, and Education Studies Certificate students. WR, SO RP

* **EDST 3205b, Effective Teaching in the Secondary Classroom, Humanities** Melissa Scheve

Children across America spend roughly 12,000 hours in school from kindergarten through grade 12. How those instructional hours are spent dramatically impacts students' academic and personal well-being. Many studies have demonstrated that teacher quality matters to students' long-term outcomes including graduation and job placement. In this course, we delve into the essential principles of being an effective teacher, focusing specifically on the U.S. secondary classroom. Building community, designing culturally sustaining curriculum, teaching inclusively, and assessing students authentically are a handful of the principles we explore together through articles about teacher practice, video examples of classroom practice, and students opportunity to enact some of these practices during class. Each student is paired with a current secondary public school teacher across America to engage in a case study of effective teaching throughout the seminar. By the end of this course, you learn some core principles of effective teaching, gain an understanding of the complexities of enacting effective teaching practices given educational inequities, conduct a case study about effective teaching, and practice some aspects of secondary teaching. EDST 1110 recommended. SO

* **EDST 3207b / EDST 207, Effective Secondary Teaching, STEM** Erica Watson

American students in grades Pre-K-12 spend about 12,000 hours in school, with studies highlighting the need for quality teaching that can ultimately guide learners towards graduation, job placement, and a broader view of the world at large. During this course we explore secondary STEM pedagogical practices by integrating anti-racist practices into community building, curriculum design, inclusive teaching, assessment, and more. Each student enrolled in this course is paired with a current secondary STEM school teacher ("Partner Teacher") in New Haven Public Schools to engage in a semester-long case study of effective STEM teaching, and each Yale student teaches one lesson in the respective partner teacher's class, all culminating in an understanding of the complexities of enacting anti-racist teaching within the STEM classroom and lab. EDST 1110 recommended. SO

* **EDST 3350a, Alternative Approaches to Pedagogy** Mira Debs

Alternative approaches to teaching and learning extend from preschool to university. These alternative approaches include student-centered learning through extended projects emphasizing student autonomy and choice, hands-on materials, and learning outdoors. Through readings and school observations in sites around New Haven, the course examines Freire's critical pedagogy, Indigenous approaches to education both past and present, Dewey & Progressive Education, Montessori, place-based learning and forest schooling, home schooling, and alternative approaches to university pedagogy. Prerequisite: EDST 1110 recommended. WR, SO

* **EDST 3820a / MATH 4820a, Senior Seminar: Math Education Topics** Miki Havlickova
The goal of the seminar is to explore topics of mathematics education at the college level, and work on presentation and teaching skills that can be useful in the classroom and in other settings. Everyone has several opportunities to practice teaching in the seminar, with guidance about explaining new material, choosing examples, implementing active learning strategies, and other skills. In other lessons, we discuss papers on pedagogy and classroom case studies. We also have sessions on public speaking, belonging in math, grading, and other topics relevant to mathematics instruction. The course is open to students in any major. It cannot be used as a mathematics elective. Seniors majoring in Mathematics or Mathematics + Philosophy may use the seminar to fulfill the senior requirement. In the pilot year, enrollment will be limited to 12 students, selected through an application process during April registration. MATH 225 or MATH 226, and MATH 255 or MATH 256

* **EDST 4400a or b, Senior Capstone I** Talya Zemach-Bersin
The first course in the yearlong sequence, followed by EDST 4410/EDST 4490 preparing students for a thesis-equivalent capstone project and overview of education studies methodologies and practical research design. Enrollment is limited to Education Studies Scholar Intensive students in their senior year (fall 2025) and spring of their junior year (spring 2026 onwards).

* **EDST 4410b, Senior Capstone II** Eleanor Schiff
The second course in the yearlong Education Studies Scholars capstone sequence where students conduct a rigorous project on a topic of their choice in education theory and research, policy, and/or pedagogy. Enrollment is limited to Education Studies Scholar Intensive students in their senior year.

* **EDST 4490b, Senior Essay Independent Study** Eleanor Schiff
Independent research under faculty direction resulting in a final capstone paper. This course is open to Scholar Intensive Certificate students in the second semester of their capstone, in lieu of taking EDST 4410. To register for this course, students must submit a written plan of study approved by their faculty advisers to the instructor no later than the end of registration period in the term in which the course is to be taken. Students will continue to meet regularly with their advisers and follow the assignment sequence established in EDST 4410.

Egyptian (EGYP)

EGYP 1100a, Introduction to Classical Hieroglyphic Egyptian I Staff
Introduction to the language of ancient pharaonic Egypt (Middle Egyptian) and its hieroglyphic writing system, with short historical, literary, and religious texts. Grammatical analysis with exercises in reading, translation, and composition. L1

EGYP 1170a, Elementary Biblical Coptic I Melania Linderman
The native Egyptian language in the Roman and Byzantine periods. Thorough grounding in grammar and vocabulary of the Sahidic dialect as a basis for reading biblical, monastic, and Gnostic texts. Credit only on completion of EGYP 1270. L1

EGYP 1200b, Introduction to Classical Hieroglyphic Egyptian II John Darnell
Continuation of EGYP 1100. Prerequisite: EGYP 1100. L2

EGYP 1270b, Elementary Biblical Coptic II David Baldi
Continued study of the native Egyptian language in the Roman and Byzantine periods. Thorough grounding in grammar and vocabulary of the Sahidic dialect as a basis for reading biblical, monastic, and Gnostic texts. Prerequisite: EGYP 1170. L2

* **EGYP 1310a, Intermediate Egyptian I: Literary Texts** John Darnell
This course engages in close reading of Middle Egyptian literary texts in hieroglyphic transcription, along with an introduction to the hieratic (cursive) Egyptian script of the original sources. Primary sources include the Middle Kingdom stories, principally those known by the modern titles "The Story of Sinuhe" and "The Tale of the Eloquent Peasant." Assigned secondary literature includes reviews of grammatical topics in Middle Egyptian and analyses of the cultural, religious, and historical context of the literary texts. We also read portions of texts from other genres—historical, administrative, etc.—that serve to illuminate concepts and practices appearing in the literary compositions. Prerequisite: EGYP 1200 or permission of instructor. L3

* **EGYP 1410b, Intermediate Egyptian: Historical Texts** Staff
Close reading of Middle Egyptian historical texts in original hieroglyphic and hieratic script. Initial survey of ancient Egyptian historiography and grammatical forms peculiar to this genre of text. Prerequisite: EGYP 1200. Counts as L4 if taken after EGYP 1310. L3

* **EGYP 2280a, The Ancient Egyptian Netherworld Books** John Darnell
Study of the Netherworld Books, known primarily from the royal tombs of the New Kingdom. Readings from the Book of the Hidden Chamber (*Amduat*), Book of Gates, Book of Caverns, Book of the Creation of the Solar Disk, Books of the Day and the Night, Books of the Solar-Osirian Unity, Book of the Heavenly Cow, and the Book of Nut. The course introduces the study of ancient Egyptian cryptography, and includes discussions of the significance of these texts for understanding Egyptian religion and the possible contributions of these compositions to the later Hermetica and Christian Gnosticism. Prerequisites: EGYP 1100 and EGYP 1200 or equivalent. L5 RP

Electrical Engineering (EENG)

Energy Studies (ENRG)

Engineering & Applied Science (ENAS)

* **ENAS 0500a / APHY 0500a / PHYS 0500a, Science of Modern Technology and Public Policy** Daniel Prober
Examination of the science behind selected advances in modern technology and implications for public policy, with focus on the scientific and contextual basis of each advance. Topics are developed by the participants with the instructor and with guest lecturers, and may include nanotechnology, quantum computation and cryptography, renewable energy technologies, optical systems for communication and medical diagnostics, transistors, satellite imaging and global positioning systems, large-scale immunization, and DNA made to order. Enrollment limited to first-year students. SC

* **ENAS 0800b / APHY 0800b and APHY 1000b / EPS 0800b / EVST 0080b and EVST 1000b / PHYS 0800b and PHYS 1000b, Energy, Environment, and Public Policy** Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non–science majors with strong backgrounds in math and science. Tours are be conducted of major examples of good energy design at Yale, including the Yale Power Plant and Kroon Hall. Students who take this course are not eligible to take APHY 100. Prerequisites: High school chemistry, physics, and Math. Calculus is not required. Enrollment limited to first-year students. QR, SC

* **ENAS 1180a, Introduction to Engineering, Innovation, and Design** Lawrence Wilen

An introduction to engineering, innovation, and design process. Principles of material selection, stoichiometry, modeling, data acquisition, sensors, rapid prototyping, and elementary microcontroller programming. Types of engineering and the roles engineers play in a wide range of organizations. Lectures are interspersed with practical exercises. Students work in small teams on an engineering/innovation project at the end of the term. Priority to first-year students. SC RP

* **ENAS 1200a / CENG 1200a / ENVE 1200a, Introduction to Environmental Engineering** Colby Buehler

Introduction to engineering principles related to the environment, with emphasis on causes of problems and technologies for abatement. Topics include air and water pollution, global climate change, hazardous chemical and emerging environmental technologies. Prerequisites: high school calculus and chemistry or CHEM 161, 165 or CHEM 163, 167 (may be taken concurrently) or permission of instructor. QR, SC

ENAS 1300a or b, Introduction to Computing for Engineers and Scientists Staff

An introduction to the use of the C and C++ programming languages and the software packages Mathematica and MATLAB to solve a variety of problems encountered in mathematics, the natural sciences, and engineering. General problem-solving techniques, object-oriented programming, elementary numerical methods, data analysis, and graphical display of computational results. Prerequisite: MATH 115 or equivalent. Recommended preparation: previous programming experience. QR

ENAS 1510a or b / APHY 1510a or b / PHYS 1510a or b, Multivariable Calculus for Engineers Staff

An introduction to multivariable calculus focusing on applications to engineering problems. Topics include vector-valued functions, vector analysis, partial differentiation, multiple integrals, vector calculus, and the theorems of Green, Stokes, and Gauss. Prerequisite: MATH 115 or equivalent. QR

ENAS 1940a or b / APHY 1940a or b, Ordinary and Partial Differential Equations with Applications Staff

Basic theory of ordinary and partial differential equations useful in applications. First- and second-order equations, separation of variables, power series solutions, Fourier series, Laplace transforms. Prerequisites: ENAS 151 or MATH 120 or equivalent, and knowledge of matrix-based operations. QR

ENAS 2170a, Disruptive Technologies and Responsible Innovation Kathryn Guarini
This course gives students insights into disruptive technologies and the mechanisms of driving responsible innovation. It helps demystify current-day innovations that are having a profound impact on the world—how they work and how they came to be. And it helps them understand how concepts take shape and get driven into the market. What makes an idea great? How do leaders develop robust solutions, mitigate risks, and extract value? This class covers concepts and frameworks and explores case studies of various disruptive technologies, establishing the technical underpinnings and discussing their societal implications. This course is appropriate for any students interested in exploring timely technology-related themes shaping society and the world. There are no prerequisites. SC

* **ENAS 3450b / CENG 3450b, Principles and Applications of Interfacial Phenomena** Kyle Vanderlick
This course covers the nature and consequences of both flexible and rigid interfaces, such as those associated with liquids and solids respectively. We examine the properties of interfaces as they exist alone, as a collective (e.g., colloids), and also as they interact demonstrably with one another. An integral part of this course is the introduction and application of engineering analysis to calculate and predict behaviors central to technological applications. This course is designed for engineering majors. Other STEM majors are welcome but physics and multivariable calculus are prerequisites. Ideally, students should also have taken thermodynamics but this is not formally required. SC

* **ENAS 3600b / ENVE 3600b, Bio-Inspired and Sustainable Design** Julie Zimmerman
Study of green engineering, focusing on key approaches to advancing sustainability through engineering design with an emphasis on biomimicry. Topics include current design, manufacturing, and disposal processes; toxicity and benign alternatives; policy implications; pollution prevention and source reduction; separations and disassembly; material and energy efficiencies and flows; systems analysis; and life cycle design, management, and analysis. permission of instructor

* **ENAS 4030a, Funding It: Innovation, Entrepreneurship, and Venture Capital** Jorge Torres
A survey of the origins, practice, and business models of venture capital with application to engineering science. Consideration of three major areas: the history and purpose of venture capital; the practical details of venture investing; and advanced topics on business models, technology ecosystems, and ethics. Particular exposure to principles of entrepreneurship, including intellectual property strategy, market validation, customer discovery, positioning, and capital formation. Separate application required at: https://bit.ly/ENAS403

* **ENAS 4240b, Finding Yourself in the Future of Creativity** John Kao
This course is for aspiring entrepreneurs, future leaders, and innovators who want to understand and amplify their creative potential to make a meaningful impact. It explores the forces shaping creativity in the 21st century, including its relationship to cutting-edge brain science, the integration of human and machine intelligence, and the cultural and political landscapes influencing creativity on a global scale. It also considers the ethical challenges of navigating creativity's growing role in solving complex societal problems. Unlike traditional courses on innovation, entrepreneurship,

and leadership that focus on external strategies—what to do and how to analyze—this course emphasizes the "internalities": the human and cognitive dimensions that drive creative outcomes. Through a combination of reflective exercises, experiential projects, directed readings, and collaborative work, students explore the deeper structures of creative thought and practice. The course is designed for those ready to engage in personal exploration, self-assessment, and the development of actionable frameworks for creative leadership.

English Language and Literature (ENGL)

* **ENGL 0133a / LING 0330a, Words, Words, Words: The Structure and History of English Words** Peter Grund

Meggings. Perpendicular. Up. Ain't. Eerily. Bae. The. These are all words in the English language, but, like all words, they have different meanings, functions, and social purposes; indeed, the meaning and function may be different for the same word depending on the context in which we use it (whether spoken or written). In this course, we explore the wonderful world of words. We look at how we create new words (and why), how we change the meaning of words, and how words have been lost (and revived) over time. As we do so, we look at debates over words and their meanings now (such as the feeling by some that *ain't* is not a word at all) and historically (such as the distaste for *subpeditals* for 'shoes' in the sixteenth century), and how words can be manipulated to insult, hurt, and discriminate against others. We look at a wide range of texts by well-known authors (such as Shakespeare) as well as anonymous online bloggers, and we make use of online tools like the Google Ngram viewer and the Corpus of Historical American English to see how words change over time. At the end of the course, I hope you see how we make sophisticated use of words and how studying them opens up new ways for you to understand why other people use words the way they do and how you can use words for various purposes in your own speech and writing. Enrollment limited to first-year students. HU

* **ENGL 0440b / ART 0740b, Writer as Designer, Designer as Writer** Rachel Kauder Nalebuff and Alice Chung

This seminar invites us to explore the boundaries between written and visual expression. Students with a background or interest in visual art learn to harness their voices as writers, and writers learn tools for how words take on new meaning through visual compositions. The course investigates the relationship between form and content through the creation of three projects—an interview, a manual, and an essay—each of which is written, designed, and physically produced using a variety of tools at our disposal. Through readings, in-class discussion and exercises, as well as workshops, we consider the ways language and ideas can be communicated to others through different media, and how that media in itself also carries meaning. The aim of the course is to playfully blur the categories of "writer" and "designer" so that we can be both at once: messengers. Previously ENGL 041. Enrollment limited to first-year students. This course does not count toward the Creative Writing Concentration for English majors. HU

* **ENGL 0711a / PLSC 0223a, Lincoln in Thought and Action** David Bromwich

An intensive examination of the career, political thought, and speeches of Abraham Lincoln in their historical context. Enrollment limited to first-year students. WR, HU

* **ENGL 0729b / AMST 0029b / AMST 029 / HUMS 0320b, Henry Thoreau** Michael Warner
Henry Thoreau played a critical role in the development of environmentalism, American prose, civil rights, and the politics of protest. We read his writing in depth, and with care, understanding it both in its historical context and in its relation to present concerns of democracy and climate change. We read his published writing and parts of the journal, as well as biographical and contextual material. The class makes a field trip to Walden Pond and Concord, learning about climate change at Walden as revealed by Thoreau's unparalleled documentation of his biotic surroundings. Student's consider Thoreau's place in current debates about the environment and politics, and are encouraged to make connection with those debates in a final paper. Previously ENGL 029. Enrollment limited to first-year students. HU

* **ENGL 0763b, Vampires, Castles, and Werewolves** Heather Klemann
What happens when a mirror held up to our world reflects back something ominously and unreasonably distorted? How do the sublime, the uncanny, and the supernatural fashion and fracture our sense of self? Examining gothic novels from the 18th and 19th centuries—the stuff of craggy cliffs, mysterious dungeons, and their paranormal inhabitants—alongside 20th and 21st-century films, this course explores the historical origins and deep cultural legacy of literary responses to the so-called Age of Reason. As we tour medieval monasteries, shadowy back alleys of London, and abysmal realms of the subconscious, we consider how literary representations of unreason affirm and unsettle our understanding of lived experience and our faith in laws of science and logic. Gothic fiction has long provided fertile ground for cultivating ideas about race, gender, sexuality, and colonialism—special attention is given to these topics throughout the course. Readings include *Frankenstein*, *Mexican Gothic*, The *Strange Case of Dr. Jekyll and Mr. Hyde*, and *Dracula*. Films include Peele's *Get Out*, Bong's *Parasite*, and Hitchcock's *Rebecca*. Formerly ENGL 063. Enrollment limited to first-year students. WR, HU

* **ENGL 0820a / HUMS 0220a, Six Global Perspectives on Biography** Ernest Mitchell
This course focuses on the humanities through an intensive study of transatlantic biographers. We examine six roles biographers can play: the archivalist, the contemporary, the fictionalizer, the listener, the miniaturist, and the systematizer. Our readings range widely over cultures, places, and times: from Senegalese griots to the *Lives* of Mary Shelley; from Gertrude Stein's "autobiographies" to the microbiographies of Jorge Luis Borges; from fragments by Walter Benjamin to Daphne Brooks' liner notes on Beyoncé. We devote sustained attention to developing writing skills and introduce students to the special collections, art galleries, and rare books libraries of Yale. Friday sessions alternate between writing workshops and field trips to Yale collections. This course is part of the "Six Pretty Good Ideas" program. Enrollment limited to first-year students. Students enroll concurrently with HUMS 0299, Six Global Perspectives Lab. WR, HU 0 Course cr

* **ENGL 0839a / AMST 0039a / ER&M 1539a, Latinx Literature Aside the Law** Joseph Miranda
How has Latinx identity emerged through and against the law? From the suspension of Puerto Rican sovereignty to the contemporary proliferation of ethnic studies bans, the state has used the law to delimit Latinx to transparent or static categories of irregular "citizen," "refugee," and "migrant." If conventional thinking assumes that art only

responds to the law in protest or affirmation of the status quo, this seminar introduces students to the ways Latinx literature engages, resists, and disidentifies with the law as it delineates national belonging. We ask how do Latinx creative expressions expand the notions of citizenship, nation, and family beyond their raced, classed, and gendered origins to imagine new futures. Through attention to contemporary tv, film, novels, and poetry, we examine how Latinx artists build alternative forms of thriving collective life in forms of mutual aid, queer kinship, party, and protest. Works up for discussion include those by Justin Torres, Raquel Salas Rivera, and the television show *Vida.* Drawing inspiration from these texts, students collaborate on podcasts, write analytical essays, and complete other critical and creative projects. Enrollment limited to first-year students. WR, HU

* **ENGL 0890a / CPLT 0290a, Literatures of Canada: Colony, Nation, Postcolony**
Katie Trumpener
Why isn't Canada just a (vast) 51st state? What are Americans fantasizing about when they imagine moving or fleeing there (and what do they find if they actually do)? This seminar explores Canada's long, complex history, and striking linguistic diversity by exploring its literary (and at moments, its cinematic) traditions. Like Canada itself, its literature represents a "contact zone" between First Nations peoples, French and British settlers, and immigrants from Eastern Europe, East and South Asia, and the Caribbean. We focus particularly on Canada's diverse early literatures (from oral tradition and Jesuit hymn to a sentimental novel-in-letters); on the unusually prominent role of women writers across Canadian literary history; on the emergence of an experimental Québecois and francophone literature (which utilized both Montreal patois and Acadian French as new literary languages); on the differences between French and English Canadian cultural nationalism; on attempts to rethink colonial history and critiques of Canada's ongoing decolonization process by generations of Indigenous, immigrant and ethnic writers. This course explores both literary history and literary form; works by internationally famous writers (Leonard Cohen, Marie-Claire Blais, Margaret Atwood, Alice Munro, Michael Ondaatje, Rohinton Mistry) and innovative local counterparts. The course concludes with several weeks on recent First Nations writing. Enrollment limited to first-year students. All texts are available in English translation. Knowledge of French—or any other language beyond English spoken by Canadians—is an asset for the whole class, but by no means required.) WR, HU

* **ENGL 1014a, Writing Seminars** Staff
Instruction in writing well-reasoned analyses and academic arguments, with emphasis on the importance of reading, research, and revision. Using examples of nonfiction prose from a variety of academic disciplines, individual sections focus on topics such as the city, childhood, globalization, inequality, food culture, sports, and war. Formerly ENGL 114. WR

* **ENGL 1015a, Literature Seminars** Staff
Exploration of major themes in selected works of literature. Individual sections focus on topics such as war, justice, childhood, sex and gender, the supernatural, and the natural world. Emphasis on the development of writing skills and the analysis of fiction, poetry, drama, and nonfiction prose. WR, HU

* **ENGL 1020a, Reading and Writing the Modern Essay** Staff
Close reading of great nonfiction prepares students to develop mastery of the craft of powerful writing in the humanities and in all fields of human endeavor, within the

university and beyond. Study of some of the finest essayists in the English language, including James Baldwin, Joan Didion, Leslie Jamison, Jhumpa Lahiri, George Orwell, David Foster Wallace, and Virginia Woolf. Assignments challenge students to craft persuasive arguments from personal experience, to portray people and places, and to interpret fundamental aspects of modern culture. WR

*** ENGL 1023a, Introduction to Creative Writing** Staff
Introduction to the writing of fiction, poetry, and drama. Development of the basic skills used to create imaginative literature. Fundamentals of craft and composition; the distinct but related techniques used in the three genres. Story, scene, and character in fiction; sound, line, image, and voice in poetry; monologue, dialogue, and action in drama. HU

*** ENGL 1025a, Readings in English Poetry I** Staff
Introduction to the English literary tradition through close reading of select poems from the seventh through the seventeenth centuries. Emphasis on developing skills of literary interpretation and critical writing; diverse linguistic and social histories; and the many varieties of identity and authority in early literary cultures. Readings may include *Beowulf*, *The Canterbury Tales*, Middle English lyrics, *The Faerie Queene*, *Paradise Lost*, and poems by Isabella Whitney, Philip Sidney, William Shakespeare, Amelia Lanyer, John Donne, and George Herbert, among others. WR, HU

*** ENGL 1026a, Readings in English Poetry II** Staff
Introduction to the English literary tradition through close reading of select poems from the eighteenth century through the present. Emphasis on developing skills of literary interpretation and critical writing; diverse genres and social histories; and modernity's multiple canons and traditions. Authors may include Alexander Pope, William Wordsworth, Elizabeth Barrett Browning, Robert Browning, W. B. Yeats, T. S. Eliot, Langston Hughes, Gertrude Stein, Gwendolyn Brooks, Elizabeth Bishop, and Derek Walcott, among others. WR, HU

*** ENGL 1027a, Readings in American Literature** Staff
Introduction to the American literary tradition in a variety of poetic and narrative forms and in diverse historical contexts. Emphasis on developing skills of literary interpretation and critical writing; diverse linguistic and social histories; and the place of race, class, gender, and sexuality in American literary culture. Authors may include Phillis Wheatley, Henry David Thoreau, Herman Melville, Walt Whitman, Emily Dickinson, Frederick Douglass, Gertrude Stein, Langston Hughes, Ralph Ellison, Flannery O'Connor, Allen Ginsberg, Chang-Rae Lee, and Toni Morrison, among others. WR, HU

*** ENGL 1028a, Readings in Comparative World English Literatures** Staff
An introduction to the literary traditions of the Anglophone world in a variety of poetic and narrative forms and historical contexts. Emphasis on developing skills of literary interpretation and critical writing; diverse linguistic, cultural and racial histories; and on the politics of empire and liberation struggles. Authors may include Daniel Defoe, Mary Prince, J. M. Synge, James Joyce, C. L. R. James, Claude McKay, Jean Rhys, Yvonne Vera, Chinua Achebe, Ngugi wa Thiong'o, J. M. Coetzee, Brian Friel, Amitav Ghosh, Salman Rushdie, Alice Munro, Derek Walcott, and Patrick White, among others. WR, HU

*** ENGL 1029a / CPLT 1680a / HUMS 1270a / TDPS 1005a, Tragedy in the European Literary Tradition** Shane Vogel

The genre of tragedy from its origins in ancient Greece and Rome through the European Renaissance to the present day. Themes of justice, religion, free will, family, gender, race, and dramaturgy. Works might include Aristotle's *Poetics* or Homer's *Iliad* and plays by Aeschylus, Sophocles, Euripides, Seneca, Hrotsvitha, Shakespeare, Lope de Vega, Calderon, Racine, Büchner, Ibsen, Strindberg, Chekhov, Wedekind, Synge, Lorca, Brecht, Beckett, Soyinka, Tarell Alvin McCraney, and Lynn Nottage. Focus on textual analysis and on developing the craft of persuasive argument through writing. Formerly ENGL 129. WR, HU

*** ENGL 1030a / CPLT 1690a / HUMS 1320a, Epic in the European Literary Tradition** Craig Eklund

The epic tradition traced from its foundations in ancient Greece and Rome to the modern novel. The creation of cultural values and identities; exile and homecoming; the heroic in times of war and of peace; the role of the individual within society; memory and history; politics of gender, race, and religion. Works include Homer's *Odyssey,* Vergil's *Aeneid,* Dante's *Inferno,* Cervantes's *Don Quixote,* and Joyce's *Ulysses.* Focus on textual analysis and on developing the craft of persuasive argument through writing. Formerly ENGL 130. WR, HU

ENGL 2003b / AFST 203b / LING 2030b, English in Post-Colonial Africa and the African Diaspora Staff

This course explores the importance of the English language in Post-colonial Africa. By examining the historical, socio-political, and cultural contexts that have influenced the evolution and adaptation of the English language, students will acquire insights into the linguistic diversity found in post-colonial Africa and its practical implications. The course explores the relationship between English and indigenous languages, focusing on their continuing influence in education, governance, literature, and identity formation. We also look at the linguistic structure of African American Vernacular English and explore possible connections to the languages of Africa and English-based creoles such as Gullah, spoken in the Caribbean and off the South Carolina coast. HU, SO

*** ENGL 2013a, Literary Production: Prose** Staff

This course provides students with an in-depth look into contemporary literary production from all sides of the publishing process: writing, reading, and editing. Taught by current editors of *The Yale Review*, and housed at the *Review*'s offices, this course offers students invaluable hands-on experience at a state-of-the-art literary and cultural magazine. They'll emerge from it equipped with a new set of skills, making them sharper readers, bolder creative writers, and better editors. Reading as an editor offers students a unique perspective on today's literary landscape, deepens their understanding of style, form, and genre—and gives them practical skills involved in 21st-century publishing. Students are introduced to the concept of assigning pieces and thinking about what kind of magazine stories can add value to an ever-more fast-paced and reactive media landscape. They read fiction and nonfiction submissions from our queue and discuss which pieces might be worth publishing, and why. And they follow and work on drafts of pieces as they go through the process of editing, promotion, and publication. Along the way, they may also write and revise a creative piece of their own, becoming better writers by learning to read and think as editors. Formerly ENGL 413.

* **ENGL 2145a / FILM 4220a / HUMS 4145a, The Aesthetics of Adaptation** Katja Lindskog
Adaptations of literary texts are the bread and butter of visual narrative media like TV and film. Adaptations of certain authors and texts have given rise to entire sub-genres and cottage industries. We consider what adaptations of literary texts, particularly very famous and beloved texts, might help us understand better about the texts themselves, and about the needs and expectations of the audiences of their adaptations. To that purpose, this course explores the purposes and effects of adaptation through a study of a variety of screen versions of adapted texts by authors including Jane Austen, Emily St. John Mandel, and Geoffrey Chaucer. Assigned readings include both literary texts and screen adaptations. HU

* **ENGL 2149a / CPLT 3049a / TDPS 3012a, Tragedy and Drama of Reconciliation** Jan Hagens
Close reading of dramas of reconciliation from the Western canon that have traditionally been categorized as tragedies. Ways in which the recategorization of such plays lends additional complexity and meaning to their endings and allows for new interpretations of the texts, their authors, and the history of drama. HU

* **ENGL 2151a / FILM 2540a, Skin and Surface: Fashion and Culture** Staff
What do we mean by fashion? This course explores the intimate relationship between film, fashion, and various modes of self-fashioning and unfashioning. By examining the sartorial—what, or whom, we wear—in literature and film, we consider the ramifications of style in discourses on race and gender. We study films, novels, and photography that focus on garments in ways that highlight the complex relationship among material histories, social fabrics, and notions of the corporeal and the human. Along the way, we unsettle the easy yet stubborn distinction between surface and interiority. From Alfred Hitchcock's Vertigo to Wendell B. Harris's Chameleon Street, Frederick Wiseman's documentary of department stores to Lee Bul's cyborg sculptures, this course asks: how does fashion constitute—or unravel—our notions of the self and of the world as "surface" activity? HU

* **ENGL 2411a / FILM 3990a, The Craft of Graphic Narrative** Alison Bechdel
This class explores the ways that text and sequential images work together to tell stories. This class will be a roughly equal mix of theory and practice, of reading comics with a critical eye and making your own comics. We'll study aspects of craft like voice, structure, point of view, description, and character development, as well as comics-specific elements such as page layout, panel transitions, and the abstract-to-realistic drawing style continuum. This is a beginner-level class. You don't need to be an experienced cartoonist, but an affinity for drawing will serve you well. RP

* **ENGL 2415a / CPLT 3048a / HUMS 1996 / JDST 3816, The Practice of Literary Translation** Robyn Creswell
This course combines a seminar on the history and theory of translation (Tuesdays) with a hands-on workshop (Thursdays). The readings lead us through a series of case studies comparing, on the one hand, multiple translations of given literary works and, on the other, classic statements about translation—by translators themselves and prominent theorists. We consider both poetry and prose from the Bible, selections from Chinese, Greek, and Latin verse, classical Arabic and Persian literature, prose by Cervantes, Borges, and others, and modern European poetry (including Pushkin, Baudelaire, and Rilke). Students are expected to prepare short class presentations,

participate in a weekly workshop, try their hand at a series of translation exercises, and undertake an intensive, semester-long translation project. Proficiency in a foreign language is required. Previously ENGL 456. HU

* **ENGL 2441a, The Craft of Fiction** Staff
Fundamentals of the craft of fiction writing explored through readings from classic and contemporary short stories and novels. Focus on how each author has used the fundamentals of craft. Writing exercises emphasize elements such as voice, structure, point of view, character, and tone. Formerly ENGL 134 or ENGL 404. HU

* **ENGL 2455a / TDPS 2301a, Writing Dance** Brian Seibert
The esteemed choreographer Merce Cunningham once compared writing about dance to trying to nail Jello-O to the wall. This seminar and workshop takes on the challenge. Taught by a dance critic for the New York Times, the course uses a close reading of exemplary dance writing to introduce approaches that students then try themselves, in response to filmed dance and live performances in New York City, in the widest possible variety of genres. No previous knowledge of dance is required. WR, HU

* **ENGL 2464a / AMST 1184a / HUMS 1840a, Approaches to Contemporary Biography: Writing and Reading Biography** Karin Roffman
The art of biography explored through groundbreaking examples, with particular emphasis on contemporary texts that explore the lives and work of artists. Topics on biographical theory and practice include: the balance of life and work; the relationship between biographer and subject; creative approaches to archives and research; and imaginative narrative strategies. Some classes take place at the Beinecke Library and there are some visits by working biographers. Students must complete an original biographical project by the end of the semester. HU RP

* **ENGL 2821a / CPLT 2190a / HUMS 4320a, The Waste Land** Paul Grimstad
The seminar looks closely at the most influential poem of the 20th century, T.S. Eliot's "The Waste Land." Attention to the poem both as a work of radical modernist experiment and as carrying on a kaleidoscopic dialogue with world literature. Taking our cue from the notes Eliot added to the poem we read selections from the Buddha's Fire Sermon, the Upanishads, versions of the Holy Grail myth, Dante's Inferno, The Tempest, Charles Baudelaire's Fleurs du mal, and F.H. Bradley's Appearance and Reality. Further reading includes Eliot's earlier poetry, especially "The Love Song of J. Alfred Prufrock," and his own criticism of the period, including "Tradition and the Individual Talent," "The Metaphysical Poets," and "Ulysses, Order and Myth." We also consider critical appraisals of the poem by Virginia Woolf, F.R. Leavis and Ralph Ellison, be attentive to comparable aesthetic innovations of the period in painting and music (cubism, Stravinsky's Le sacre du printemps, ragtime), and listen to audio recordings of Eliot (and others) reading the poem. Meditation throughout on the poem as a collage of allusions forming a complex work of art. At least one course that involves close reading literary prose or poetry. WR, HU

* **ENGL 2826a / AMST 2246a / PLSC 2846a, The Media and Democracy** Joanne Lipman
In an era of "fake news," when the media is under attack, misinformation is at epidemic levels, and new technologies are transforming the way we consume news, how do journalists hold power to account? What is the media's role in promoting and protecting democracy? Students explore topics including objectivity versus advocacy,

and hate speech versus First Amendment speech protections. Case studies span from 19th century Yellow Journalism to the #MeToo and #BlackLivesMatter movements, to the rise of AI journalism and social media "news influencers." SO

* **ENGL 2831a / AFST 3351a / CPLT 3351a / FILM 3537a, The Nigerian 'Video Novel' and Nollywood** Staff

The course introduces students to an emerging genre of the Nigerian novel in which writers adopt narrative re-purposing strategies that invite transcription and adaptation to films. This evolving 'Nigerian visual novel', or 'video novel', is defined by its loosely structured, tabloid-themed and reader-friendly style, all reflecting the craft of Nollywood films, a thriving video film culture that emerged in the 1990s and has remained popular globally. Through the study of Nollywood films alongside new Nigerian fiction, the course will examine the techniques adopted by writers to accommodate the aesthetics of popular culture, to revive a declining readership, and to make literature more sellable. As these novels win literature prizes and find their way onto syllabi, the implications they have for our understanding of the African literary canon will be discussed. Students will view selected Nollywood movies and read a number of novels in the new genre in order to appraise the extent to which the serious and the sensuous intersect in this remaking of literariness. Seminar discussions will be accompanied by short lectures in which concepts such as 'trans-mediality', 'reverse-adaptation', 'screen-to-page', 'appropriation' and 'quotation' will be discussed to build an understanding of how the 'new' approach reconfigures Nigerian novels. HU

* **ENGL 2846a / ER&M 3046a, Critical Reading Methods in Indigenous Literatures** Tarren Andrews

This course focuses on developing critical readings skills grounded in the embodied and place-based reading practices encouraged by Indigenous literatures. Students are expected to think critically about their reading practices and environments to consciously cultivate place-based reading strategies across a variety of genres including: fiction and non-fiction, sci-fi, poetry, comic books, criticism, theory, film, and other new media. Students are required to keep a reading journal and regularly present critical reflections on their reading process, as well as engage in group annotations of primary and secondary reading materials. This course is offered during the fall and spring term and may be taken both terms for credit. During the fall term the focus is on Indigenous literatures and new media from North America produced primarily in the 21st century. Critical readings include some historical context, both pre- and post-contact, as well as Indigenous literary theory. During the spring term, the focus becomes Indigenous literatures and games in a global context with emphasis on Indigenous land relations and ecocriticism across the 20th and 21st centuries. WR, HU

* **ENGL 3082a / FILM 2800a / PSYC 3320a, The Science and Culture of Memory** John Williams

This is an FAS-sponsored cross-divisional course. This course offers a comparative and interdisciplinary approach to the science and culture of memory. We aim to bring traditional philosophies, narratives, and histories of memory into conversation with both long established and cutting-edge research findings on the neuroscience of memory. Questions explored in the course include: What is memory and how does it work? How has memory been conceptualized over time in both culture and science? What are the various media through which we process memories, including collective and individual forms? What can we learn from moments of mnemonic

failure? What new technologies of memory are on the horizon? How is our vision of the future influenced by the content and processes of memory? In wrestling with these questions, we encounter a wide selection of narratives, art objects, films, and scientific data. Students also have an opportunity to explore their own experiences in learning and memory (including experiential assignments, e.g., asking them to memorize certain things and report on the experience, as well as opportunities to reflect on their experiences of and access to forms of collective, communal memory). HU, SO

* **ENGL 3100a, Special Projects for Juniors or Seniors** Stefanie Markovits
Special projects set up by the student in an area of particular interest with the help of a faculty adviser and the director of undergraduate studies, intended to enable the student to cover material not otherwise offered by the department. The course may be used for research or for directed reading, but in either case a term paper or its equivalent is normally required. The student meets regularly with the faculty adviser. Proposals must be signed by the faculty adviser and submitted to the DUS in the previous term; deadlines and instructions are posted at *https://english.yale.edu/undergraduate/courses/independent-study-courses*. Formerly ENGL 488.

* **ENGL 3164a, Shakespeare and the Craft of Writing Poetry** Danielle Chapman
Shakespeare's Craft brings students into conversation with Shakespeare's plays and his sonnets; and teaches students how to draw from his many modes when writing their own poems—without attempting to sound "Shakespearean." Over the course of the semester, we read three plays and a selection of the sonnets, pairing close readings with contemporary poems that use similar techniques. We also watch performances and learn how actors and directors find personal ways into Shakespeare's protean language and meanings. Weekly assignments include both critical responses and creative assignments, focusing on specific craft elements, such as: "The Outlandish List: How to Keep Anaphora Interesting," "Verbs: How to Hurtle a Poem Forward," "Concrete Nouns and Death-defying Descriptions," "The Poet as Culture Vulture: Collecting Contemporary Details," "Exciting Enjambments and Measured Meter" and "Finis: How to Make a Poem End." This hybrid course is an exciting blend of creative and critical writing. Students decide before midterm whether they want to take the course as a Renaissance Literature or Creative Writing Credit, and this determines whether their final project is a creative portfolio or critical paper.

* **ENGL 3195a / CPLT 1540a / HUMS 3800a, The Bible as a Literature** Leslie Brisman
Study of the Bible as a literature—a collection of works exhibiting a variety of attitudes toward the conflicting claims of tradition and originality, historicity and literariness. WR, HU RP

* **ENGL 3400a, Tutorial in Writing** Stefanie Markovits
A writing tutorial in fiction, poetry, playwriting, screenwriting, or nonfiction for students who have already taken writing courses at the intermediate and advanced levels. Conducted with a faculty member after approval by the director of undergraduate studies. Proposals must be submitted to the DUS in the previous term; deadlines and instructions are posted at *https://english.yale.edu/undergraduate/courses/independent-study-courses*. Formerly ENGL 487. Prerequisites: two courses in writing.

* **ENGL 3415b / CPLT 3005b / HUMS 1997b / JDST 3843b, Advanced Literary Translation** Peter Cole
A sequel to LITR 348 or its equivalent, this course brings together advanced and seriously committed students of literary translation, especially (but not only) those who are doing translation-related senior theses. Students must apply to the class with a specific project in mind, that they have been developing or considering, and that they will present on a regular basis throughout the semester. Discussion of translations-in-progress are supplemented by short readings that include model works from the world of literary translation, among them introductions and pieces of criticism, as well as reflections by practitioners treating all phases of their art. The class is open to undergraduates and graduate students who have taken at least one translation workshop. By permission of the instructor. Formerly ENGL 483. Prerequisite: LITR 348.

* **ENGL 3421a, Poetry Writing** Maggie Millner
An intensive study of the craft of poetry, designed for aspiring creative writers. Focus on the fundamentals of poetic technique and peer review Formerly ENGL 408. RP

* **ENGL 3431a / TDPS 3400a, Playwriting** Donald Margulies
A seminar and workshop on reading for craft and writing for the stage. In addition to weekly prompts and exercises, readings include modern American and British plays by Pinter, Mamet, Churchill, Kushner, Nottage, Williams, Hansberry, Hwang, Vogel, and Wilder. Emphasis on play structure, character, and conflict. RP

* **ENGL 3434a, Writing the Television Drama** Aaron Tracy
Crafting the television drama with a strong emphasis on creating and developing an original concept from premise to pilot; with consideration that the finest television dramas being created today aspire to literary quality. Students read original scripts of current and recent critically acclaimed series and create a series document which will include formal story and world descriptions, orchestrated character biographies, a detailed pilot outline, and two or more acts of an original series pilot.

* **ENGL 3435a, American Horror Stories** Brian Price
From its earliest days, the horror genre, although often denigrated, has remained a persistent presence in our culture. This course investigates the reasons for this hold on the imagination and the social function it has provided, helping navigate questions of identity, gender, sexuality, violence, grief, loss, and otherness. Texts include films, short fiction, and critical essays. An exciting blend of creative and critical writing, this course tracks the genre's evolution and explores various subgenres and thematic points of interest through both scholarly engagement and weekly creative writing responses that culminate in a longer creative project that explores the ideas arising from the semester's discussions. HU

* **ENGL 3441a, Fiction Writing** Marie-Helene Bertino
An intensive study of the craft of fiction, designed for aspiring creative writers. Focus on the fundamentals of narrative technique and peer review. Formerly ENGL 407.

* **ENGL 3454a / HSAR 4460a / HUMS 1850a, Writing about Contemporary Figurative Art** Margaret Spillane
A workshop on journalistic strategies for looking at and writing about contemporary paintings of the human figure. Practitioners and theorists of figurative painting;

controversies, partisans, and opponents. Includes field trips to museums and galleries in New York City. WR, HU

* **ENGL 3461a, Nonfiction Writing** Christopher Hawthorne
A seminar and workshop in the craft of nonfiction writing as pertains to a given subcategory or genre. Each section focuses on a different form of nonfiction writing and explores its distinctive features through a variety of written and oral assignments. Students read key texts as models and analyze their compositional strategies. They then practice the fundamentals of nonfiction in writing and revising their own essays. Section topics, which change yearly, are listed at the beginning of each term on the English department website. This course may be repeated for credit in a section that treats a different genre or style of writing; ENGL 121 and ENGL 3461 may not be taken for credit on the same topic. Formerly ENGL 421. WR, HU

* **ENGL 3467b / ENGL 418 / EVST 3224b, Writing About The Environment** Staff
Exploration of ways in which the environment and the natural world can be channeled for literary expression. Reading and discussion of essays, reportage, and book-length works, by scientists and non-scientists alike. Students learn how to create narrative tension while also conveying complex—sometimes highly technical—information; the role of the first person in this type of writing; and where the human environment ends and the non-human one begins. Previously ENGL 418.. Admission by permission of the instructor only. Students interested in the course should email the instructor at alan.burdick@gmail.com with the following information: 1.) A few paragraphs describing your interest in taking the class. 2.) A non-academic writing sample that best represents you. WR

* **ENGL 3474b / HIST 2705b / HUMS 1740b, Writing from the Archive: Imagining the Real** Adina Hoffman
Where do the dry, who-what-which details set down on a census form meet the far messier and richer reality of the people whose names are scrawled there? And how might a writer bring that meeting about? What can a shoebox of doodle-filled letters tell us about the ways that friendship, art, war, sex, and politics struck a couple of New York novelists, c. 1941? How do we respond as writers and as a culture when faced with the lack of such inky particulars? Blending seminar and workshop, this class is meant for students who want to write literary non-fiction based on archival materials. In an intensive, hands-on fashion, we'll dig into documents of all sorts as we read essays and excerpts from belletristic works that wrestle with the sometimes slippery fact of the archive. Throughout, we'll ask how best to bring vital prose into being. Weekly writing experiments that draw from various Yale collections and beyond will encourage students to see and respond to archival discoveries freshly and for themselves. A semester-long writing project will take shape as an extension of that seeing and responding. While no previous archival experience is required, this class calls for a serious commitment to the written word. By permission of instructor. Limit 12. WR, HU

* **ENGL 3501a / LING 1500a, Old English** Emily Thornbury
An introduction to the language, literature, and culture of earliest England. A selection of both major and less-studied works of prose and verse, including charms, saints' lives, meditations on loss, a dream vision, and heroic verse, which are read in the original Old English. No prior knowledge of Old English is expected. WR, HU

*** ENGL 3505a / CPLT 1950a / HUMS 2000a / MUSI 4362a, Medieval Songlines** Ardis Butterfield
Introduction to medieval song in England via modern poetic theory, material culture, affect theory, and sound studies. Song is studied through foregrounding music as well as words, words as well as music. WR, HU

ENGL 3610a, Shakespeare: Page, Stage, and Screen Staff
A lively and wide-ranging introduction to the plays of William Shakespeare: comedies, histories, tragedies, and romances, in print, on stage, and as adapted for television, film, and other media, from the early modern period to the present. In addition to giving novices and Shakespeare buffs alike a thorough grounding in the content and contexts of the plays themselves, this course aims at developing students' abilities to analyze, interpret, and take pleasure in linguistic complexity, to think critically and creatively about the relationship between text and performance, to experiment with reading like an actor, a director, a costume designer, a queer theorist, an anti-theatrical Puritan, or a sixteenth-century playgoer, and to explore enduring issues of identity, family, sexuality, race, religion, power, ambition, violence, and desire. Lectures are complemented by weekly discussion sections, conversations with practicing theater artists, a trip to the Beinecke Rare Books Library, and opportunities to see plays in performance. WR, HU o Course cr

*** ENGL 3702a, Growing Up in the Victorian Novel** Stefanie Markovits
This course focuses on a set of British novels of the Victorian Period that organize plot through the device of Bildung: the development or education of the novel's protagonist. Questions include: What role does childhood play in development? How might we distinguish between the male and the female Bildungsroman? How do career and courtship function in these novels? How does the genre negotiate the interplay between external and internal development, subjective and objective experience? What are the political implications of the form(s) these books take for questions of gender, class, and colonialism? How do the novels negotiate both space (local, national, international) and time (personal memory and public history)? How does the form alter over the course of the period in question? Authors may include Brontë, Dickens, Eliot, Barrett Browning, Carroll, James, Kipling. WR, HU

*** ENGL 3714a / HUMS 4363a, Moby-Dick** John Peters
This seminar engages in the interpretation of a single great book, *Moby-Dick* (1851) by Herman Melville. We also read some of Melville's most relevant earlier and later works, and pay attention to the book's historical, literary, artistic, religious, economic, environmental, and technological contexts. Field trips to whaling-relevant sites possible. WR, HU

*** ENGL 3751a / WGSS 2251a, Experiments in the Novel: The Eighteenth Century** Jill Campbell
The course provides an introduction to English-language novels of the long eighteenth century (1688–1818), the period in which the novel has traditionally been understood to have "risen." Emphasizing the experimental nature of novel-writing in this early period of its history, the course foregrounds persistent questions about the genre as well as a literary-historical survey: What is the status of fictional characters? How does narrative sequence impart political or moral implications? How do conventions of the novel form shape our experience of gender? What kind of being is a narrator? Likely authors include Aphra Behn, Daniel Defoe, Samuel Richardson, Henry Fielding, Laurence

Sterne, Maria Edgeworth, Jane Austen, Jennifer Egan, Colson Whitehead, and Richard Powers. WR, HU

* **ENGL 3811a / AMST 3333a, American Strangeness** Sarah Mahurin and Aaron Magloire
This course examines various elements of strangeness—the uncanny, the macabre, the absurd, the shocking—as seen in and through modern and contemporary American literature. How do authors depict, and how do readers contend with, bizarre phenomena? What is the role of readerly expectation (met and unmet)? How do concepts of "form" and "genre" react to and against competing concepts of strangeness? We will examine convention and its breaking, mysticism and supernaturality, and our changing sense of what counts as weird. HU

* **ENGL 3831a / AMST 3831a / ER&M 3831a / WGSS 3831a, Texxture** Sunny Xiang
The term *texxture* was first used by queer studies scholars to describe a density of tactile information about an object's provenance, composition, circulation, and use. This brilliant coinage offers an immanent theorization of texture as something like an x-factor—an excess and an essence, something magical yet practical, a strange intensity and the thing itself. Such ambiguities, however, also contribute to texture's interpretive difficulties. For whether we have in mind a velvet armchair, a pair of distressed jeans, a handbound book, or a tablet computer, texture performs a dramatic revelation to the extent that it is also shadowed by deception and ambivalence. These paradoxes and cruxes inspire a range of inquiries for our class: What can the perception and creation of texture teach us about the sensorial and material politics of race, gender, empire, capitalism, and art? How might texture help us study the relation between desire and violence, especially at the interface of touch? What things, beings, events, places, emotions, and ideas appear to have a texture? What is texture's route to intelligibility, and is there a scale or unit at which texture vanishes? WR, HU

* **ENGL 3846a / HUMS 2530a / RLST 2330a, Poetry and Faith** Christian Wiman
Issues of faith examined through poetry, with a focus on modern poems from 1850 to the present. Poems from various faith traditions studied, as well as to secular and antireligious poetry. HU

ENGL 3850a, Literature and Social Justice Staff
This lecture course introduces students to a range of thinking about the relationship between literature and projects of social justice within political modernity. We read works by a wide range of literary and political thinkers from the last two-and-a-half centuries or so, reflecting especially on questions such as: What is the relationship between literature and politics? How does social change play out in literature, and, in turn, what role might literature play in social change? Where does the category of the 'literary' come from, and how does it relate to key political categories such as 'the people'? How might literature—and the arts generally—be of use to us in our attempts to create a more just, free, and equal society? How might a more just, free, and equal society allow us to relate to literature and the arts? On the literary side, our writers may include William Wordsworth, Jane Austen, W.B. Yeats, Virginia Woolf, Federico Garcia Lorca, Pablo Neruda, Czeslaw Milosz, Wislawa Szymborska, Audre Lorde, Seamus Heaney, Milan Kundera. On the political side, our thinkers may include Edmund Burke, Mary Wollstonecraft, J.S. Mill, Karl Marx, Karl Popper, Immanuel Wallerstein. Formerly ENGL 189. WR, HU 0 Course cr

ENGL 3860a / AFAM 3860a, Black Literature Staff
If we read it carefully, black literature tells a hidden history of the New World. This course introduces students to the key texts, authors, themes and traditions of African American literature. Reading major works by black writers, from the 18th century to the present, we will chart the historical conditions, social movements, and intellectual circuits that shaped this literature, as well as the innovative forms and aesthetics that characterize its signature style, depth, and dynamism. Engaging in the writing, reading, and archival practices of literary studies, we will explore black literatures as modes of expression, representation, critique, subversion, politics, fantasy, prophecy, and beyond. Authors include Frederick Douglass, Gwendolyn Brooks, Amiri Baraka, Toni Morrison, and more. WR, HU 0 Course cr

* **ENGL 4100a or b, The Senior Essay I** Stefanie Markovits, Ciru Wainaina, and Marcel Elias
Students wishing to undertake an independent senior essay in English must submit a proposal to the DUS in the previous term; deadlines and instructions are posted at *https://english.yale.edu/undergraduate/courses/independent-study-courses.* For one-term senior essays, the essay itself is due in the office of the director of undergraduate studies according to the following schedule: (1) end of the fourth week of classes: five to ten pages of writing and/or an annotated bibliography; (2) end of the ninth week of classes: a rough draft of the complete essay; (3) end of the last week of classes (fall term) or end of the next-to-last week of classes (spring term): the completed essay. Consult the director of undergraduate studies regarding the schedule for submission of the yearlong senior essay.

* **ENGL 4101a, The Senior Essay II** Stefanie Markovits, Ciru Wainaina, and Marcel Elias
Second term of the optional yearlong senior essay. Students may begin the yearlong essay in the spring term of the junior year, allowing for significant summer research, with permission of the instructor. Students must submit a proposal to the DUS in the previous term; deadlines and instructions are posted at *https://english.yale.edu/undergraduate/courses/independent-study-courses.* After ENGL 490.

* **ENGL 4400a, The Creative Writing Concentration Senior Project** Stefanie Markovits
A term-long project in writing, under tutorial supervision, aimed at producing a single longer work (or a collection of related shorter works). The creative writing concentration accepts students with demonstrated commitment to creative writing at the end of the junior year or, occasionally, in the first term of senior year. Proposals for the writing concentration should be submitted during the designated sign-up period in the term before enrollment is intended. The project is due by the end of the last week of classes (fall term), or the end of the next-to-last week of classes (spring term). Proposal instructions and deadlines are posted at *https://english.yale.edu/undergraduate/courses/independent-study-courses.*

* **ENGL 4411a / FILM 4670a, Making Comics** Alison Bechdel
This advanced class will explore the alchemy of combining words and pictures into the visual language of comics. We'll touch on some history and theory of comics, but this is a hands-on writing/drawing class, and the focus will be on practice: how to write, draw, design, and produce your own work. We'll be looking at different formats like single panel comics, strips, and minicomics, as well as full-length graphic

novels, memoirs, and journalism. You'll keep a sketchbook and develop a daily drawing practice. For most of the second half of the semester, you'll be working on your own minicomic. Some cartooning experience or drawing ability will be helpful.

* **ENGL 4421a, Advanced Poetry Writing** Cynthia Zarin
A seminar and workshop in the writing of verse. May be repeated for credit with a different instructor. RP

* **ENGL 4432a / TDPS 3403a, Advanced Playwriting** Deborah Margolin
A seminar and workshop in advanced playwriting that furthers the development of an individual voice. Study of contemporary and classical plays to understand new and traditional forms. Students write two drafts of an original one-act play or adaptation for critique in workshop sessions. Familiarity with basic playwriting tools is assumed. Open to juniors and seniors, nonmajors as well as majors, on the basis of their work; priority to Theater Studies majors. Writing samples should be submitted to the instructor before the first class meeting. Prerequisite: THST 320 or 321, or a college seminar in playwriting, or equivalent experience. RP

* **ENGL 4434a, The Art and Craft of Television Drama** Derek Green
This is an advanced seminar on the craft of dramatic television writing. Each week we'll conduct an intensive review of one or two elements of craft, using scripts from the contemporary era of prestige drama. We'll read full and partial scripts to demonstrate the element of craft being studied, and employ weekly writing exercises (both in-class and by assignment) to hone our skills on the particular elements under consideration. Students learn how to develop character backstories, series bibles, story areas, and outlines. The final assignment for the class is the completion of a working draft of a full-length script for an original series pilot. Prerequisites: No previous study required, but ENGL 3434 (formerly ENGL 425) and at least one other intro-level creative writing course are highly recommended. Permission of instructor or an application is required for enrollment.

* **ENGL 4441a, Advanced Fiction Writing** Caryl Phillips
An advanced workshop in the craft of writing fiction. May be repeated for credit with a different instructor.

* **ENGL 4451a, The Genre of the Sentence** Verlyn Klinkenborg
A workshop that explores the sentence as the basic unit of writing and the smallest unit of perception. The importance of the sentence itself versus that of form or genre. Writing as an act of discovery. Includes weekly writing assignments. Not open to first-years. HU

* **ENGL 4459a / EVST 4469a / MB&B 4590a, Writing about Science, Medicine, and the Environment** Carl Zimmer
Advanced non-fiction workshop in which students write about science, medicine, and the environment for a broad public audience. Students read exemplary work, ranging from newspaper articles to book excerpts, to learn how to translate complex subjects into compelling prose. Admission by permission of the instructor only. Applicants should email the instructor at carl@carlzimmer.com with the following information: 1. One or two samples of nonacademic, nonfiction writing. (No fiction or scientific papers, please.) Indicate the course or publication, if any, for which you wrote each sample. 2. A note in which you briefly describe your background (including writing

experience and courses) and explain why you'd like to take the course. Formerly ENGL 459. WR

*** ENGL 4460a, Journalism** Steven Brill
Examination of the practices, methods, and impact of journalism, with focus on reporting and writing; consideration of how others have done it, what works, and what doesn't. Students learn how to improve story drafts, follow best practices in journalism, improve methods for obtaining, skeptically evaluating, and assessing information, as well as writing a story for others to read. The core course for Yale Journalism Scholars. No prerequisites. WR

*** ENGL 4464a, The Others: Writing Literary Conflict** Rachel Kaadzi Ghansah
In this class, we consider how literary non-fiction articulates or imagines difference, disdain, conflict, and dislike. To deepen and enrich our reporting and interviewing, we discuss the more technical and stylistic elements present in strong non-fiction. As we read and write, we put these theoretical concerns into practice and play by writing two or three profiles about people you do not like, a place you don't care for, an idea you oppose, or an object whose value eludes you. Your writing might be about someone who haunts you without your permission or whatever else gets under your skin, but ideally, your subject makes you uncomfortable, troubles you, and confounds you. Some examples of the writing that we read are Guy Debord, Lucille Clifton, C.L.R. James, Pascale Casanova, W.G. Sebald, Jayne Cortez, AbouMaliq Simone, Greg Tate, Annie Ernaux, Edward Said, Mark Twain, Jacqueline Rose, Toni Morrison, Julia Kristeva, and Ryszard Kapuscinski. HU

*** ENGL 4469a, Advanced Nonfiction Writing** Anne Fadiman
A seminar and workshop with the theme "At Home in America." Students consider the varied ways in which modern American literary journalists write about people and places, and address the theme themselves in both reportorial and first-person work. Application required in advance; see the English website for deadline and instructions. WR, HU

*** ENGL 4502a, Chaucer** Ardis Butterfield
An exploration of the extraordinary breadth of Chaucer's writings in their original Middle English. Includes dream visions, lyrics, and the great love epic *Troilus and Criseyde*, as well as the comic, satiric, and religious narratives of his brilliant *Canterbury Tales*. Attention to the way his writings on love, hatred, on race, gender and sexuality, psychology, death, war, art, beauty, finance, corruption, laughter, and religion speak to our current moment. Training will be given in Middle English; Modern English translations available. WR, HU

*** ENGL 4733a / HUMS 4344a, Henry James** Ruth Yeazell
Selected novels by Henry James, from *Roderick Hudson* through *The Golden Bowl*. Particular attention to the international theme and to the ways in which James's later novels revisit and transform the matter of his earlier ones. WR, HU

*** ENGL 4811a / AMST 4481a / ER&M 3511a, The Native American Novel**
Lloyd Kevin Sy
This course explores the evolution of the Native American novel, tracing its development from *The Life and Adventures of Joaquín Murieta* (1854) to contemporary works. We will examine how Indigenous writers have used the novel to engage with themes such as sovereignty, memory, land, identity, assimilation, and storytelling as

resistance. Readings may include works by John Rollin Ridge, Zitkála-Šá, D'Arcy McNickle, N. Scott Momaday, Leslie Marmon Silko, Louise Erdrich, Gerald Vizenor, and Tommy Orange. Through close reading and critical analysis, we will consider how Native novelists navigate history, genre, and literary form to challenge dominant narratives. None WR, HU

* **ENGL 4822a / TDPS 3046a, Modern European Drama** Marc Robinson
Intensive study of the major playwrights of modern European drama—Ibsen, Chekhov, Strindberg, Shaw, Brecht, Genet, and Beckett—along with pertinent theater theory. Recent plays and performances that respond to canonical texts supplement the primary readings. WR, HU

* **ENGL 4834a / AFAM 4134a / AFST 4834a, Postcolonial World Literatures, 1945 to the Present** Stephanie Newell
Introduction to key debates about postwar world literatures in English, to the politics of English as a language of postcolonial literature, and to debates about globalization and culture. Themes include colonial history, postcolonial migration, translation, national identity, cosmopolitanism, and global literary prizes. WR, HU

* **ENGL 4850a, Word and Image from William Blake to Claudia Rankine** Langdon Hammer
This course investigates a visionary tradition of British and American poets and artists who find in the interface of visual art and poetry a space for political dissent, aesthetic experiment, spiritual quest, and utopian vision, in which word and image collaborate to enlarge the range of implication and possibility in both literature and art. Coordinated with the William Blake exhibition at the Yale Center for British Art scheduled for fall 2025, classes draw on collections at YCBA, the Yale University Art Gallery, and Beinecke Library. Writers and artists studied include William Blake, Hart Crane, Alfred Stieglitz, Joseph Cornell, Ian Hamilton Finlay, Susan Howe, and Claudia Rankine. For English majors, a junior seminar. For majors in other departments, an upper-level course in English, preferably in poetry. WR, HU

* **ENGL 4877a, Contemporary British Fiction** Caryl Phillips
A study of literature that responds to a changing post–World War II Britain, with attention to the problem of who "belongs" and who is an "outsider." Authors include William Trevor, Kazuo Ishiguro, Jean Rhys, Samuel Selvon, Ruth Prawer Jhabvala, and John Osborne. Formerly ENGL 416. WR, HU RP

Environmental Engineering (ENVE)

* **ENVE 1200a / CENG 1200a / ENAS 1200a, Introduction to Environmental Engineering** Colby Buehler
Introduction to engineering principles related to the environment, with emphasis on causes of problems and technologies for abatement. Topics include air and water pollution, global climate change, hazardous chemical and emerging environmental technologies. Prerequisites: high school calculus and chemistry or CHEM 161, 165 or CHEM 163, 167 (may be taken concurrently) or permission of instructor. QR, SC

ENVE 3140a / CENG 3140a, Transport Phenomena I Kyle Vanderlick
First of a two-semester sequence. Unified treatment of momentum, energy, and chemical species transport including conservation laws, flux relations, and boundary conditions. Topics include convective and diffusive transport, transport with

homogeneous and heterogeneous chemical reactions and/or phase change, and interfacial transport phenomena. Emphasis on problem analysis and mathematical modeling, including problem formulation, scaling arguments, analytical methods, approximation techniques, and numerical solutions. Prerequisite: ENAS 194 or permission of the instructor. QR, SC RP

ENVE 3150b / CENG 3150b, Transport Phenomena II Michael Loewenberg
Unified treatment of momentum, energy, and chemical species transport including conservation laws, flux relations, and boundary conditions. Topics include convective and diffusive transport, transport with homogeneous and heterogeneous chemical reactions and/or phase change, and interfacial transport phenomena. Emphasis on problem analysis and mathematical modeling, including problem formulation, scaling arguments, analytical methods, approximation techniques, and numerical solutions. Prerequisite: ENAS 194 or permission of instructor. QR, SC

* **ENVE 3600b / ENAS 3600b, Bio-Inspired and Sustainable Design** Julie Zimmerman
Study of green engineering, focusing on key approaches to advancing sustainability through engineering design with an emphasis on biomimicry. Topics include current design, manufacturing, and disposal processes; toxicity and benign alternatives; policy implications; pollution prevention and source reduction; separations and disassembly; material and energy efficiencies and flows; systems analysis; and life cycle design, management, and analysis. permission of instructor

ENVE 3730a / CENG 373 / CENG 3730a, Air Pollution Control Drew Gentner
An overview of air quality problems worldwide with a focus on emissions, chemistry, transport, and other processes that govern dynamic behavior in the atmosphere. Quantitative assessment of the determining factors of air pollution (e.g., transportation and other combustion-related sources, chemical transformations), climate change, photochemical "smog," pollutant measurement techniques, and air quality management strategies. Prerequisite: ENVE 120. QR, SC RP

* **ENVE 3770b / CENG 3770b, Water-Energy Nexus** Lea Winter
This course explores processes and technologies at the water-energy nexus. We utilize chemical and environmental engineering fundamentals to explore the links between maintaining clean water supply and energy security globally, as well as implications for environmental contamination and climate change. We develop a quantitative understanding of water chemistry and energy considerations for topics including traditional water and wastewater treatment, energy recovery from wastewater, membrane processes, water electrolysis for energy storage and electrochemical contaminant conversion, industrial water consumption and wastewater production, underground water sources and water for oil and gas, opportunities for reuse of nontraditional source waters and contaminant valorization, and considerations for decentralization, resilience, and electrification. Quantitative understanding of these processes will be attained based on mass and energy balances, systems engineering, thermodynamics, and kinetics. Prerequisite: ENVE 120 or permission of instructor. The course is primarily designed for juniors and seniors majoring in environmental engineering, but students in other engineering majors are welcome. Students in non-engineering majors are also welcome but are encouraged to communicate with

the instructor to make sure they have sufficient background knowledge in required mathematics. QR, SC

ENVE 4160b / CENG 4160b, Chemical Engineering Process Design Yehia Khalil
Study of the techniques for and the design of chemical processes and plants, applying the principles of chemical engineering and economics. Emphasis on flowsheet development and equipment selection, cost estimation and economic analysis, design strategy and optimization, safety and hazards analysis, and environmental and ethical considerations. Enrollment limited to seniors majoring in Chemical Engineering or Environmental Engineering. QR, SC RP

ENVE 4380b, Environmental Organic Chemistry John Fortner
This course examines major physical and chemical attributes and processes affecting the behavior of organic compounds in environmental systems, including volatilization, sorption/attachment, diffusion, and reactivity. Emphasis is placed on legacy pollutants (e.g. TCE, PCBs, DDT) and along with emerging contaminants of concern (e.g. pharmaceuticals, explosives, etc). The course reviews basic concepts from physical chemistry and examines the relationships between chemical structure, properties, and environmental behavior of organic compounds. Physical and chemical processes important to the fate, treatment, and transformation of specific organic compounds are addressed including solubility, volatilization, partitioning, sorption/attachment, bioaccumulation, and bulk environmental transformation pathways. Equilibrium and kinetic models based on these principles are used to predict the fate and transport of organic contaminants in the environment. Priority given to seniors or permission of instructor. QR, SC

ENVE 4400a, Aquatic Chemistry David Kwabi
This course introduces relevant elements of aquatic chemistry to upper-level undergraduate environmental engineering and science students. The course provides a fundamental basis from which to design and evaluate engineered and natural systems in which inorganic chemistry is an important component. These systems include (but are not limited to) water and wastewater treatment and CO_2 capture and sequestration. Prerequisites: One year of college chemistry, good working knowledge of algebra, or permission of the instructor.

ENVE 4410b, Biological Processes in Environmental Engineering Jordan Peccia
Fundamental aspects of microbiology and biochemistry, including stoichiometry, kinetics, and energetics of biochemical reactions, microbial growth, and microbial ecology, as they pertain to biological processes for the transformation of environmental contaminants; principles for analysis and design of aerobic and anaerobic processes, including suspended- and attached-growth systems, for treatment of conventional and hazardous pollutants in municipal and industrial wastewaters and in groundwater. Prerequisites: CHEM 161, 165, or 163, 167 (or CHEM 112, 113, or 114, 115, or 118); MCDB 290 or equivalent; or with permission of instructor. SC

ENVE 4420a, Environmental Physicochemical Processes Jaehong Kim
The course covers fundamental and applied concepts of physical and chemical ("physicochemical") processes relevant to water quality control. Topics include overview of water and wastewater treatment processes, fundamentals of chemical reaction engineering and mass balance concepts, and their application to the design of water treatment unit operations including coagulation, sedimentation, disinfection,

filtration, oxidation, air stripping, membrane separation, adsorption, and ion exchange. Prerequisite: ENVE 120 or permission of instructor.

* **ENVE 4640a / CENG 464, Engineering Solutions to Climate Change** Lea Winter
Current industrial processes that supply essential materials and energy for modern society emit greenhouse gases that drive climate change. This course develops a framework based on mass and energy balances, thermodynamics of energy conversions and chemical reactions, catalytic surface reactions, and electrochemistry to evaluate current approaches for manufacturing chemicals and fuels and to engineer sustainable alternatives as climate change solutions. Topics include contributions of the chemical industry and fuels to climate change, renewable energy transition, survey of major chemical manufacturing processes, CO_2 storage and utilization, resilient processes, and other emerging chemical manufacturing and energy storage solutions to mitigate climate change. The course involves a semester-long original analysis project. This course applies chemical and physical concepts and methods used in other science and engineering courses. Permission of instructor required.

* **ENVE 4900a or b, Senior Project** Staff
Individual research and design projects supervised by a faculty member in Environmental Engineering, or in a related field with permission of the director of undergraduate studies.

Environmental Studies (EVST)

* **EVST 0040a, Collections of the Peabody Museum** Erika Edwards
Exploration of scientific questions through the study and analysis of objects within the Peabody Museum's collections. Formulating a research question and carrying out a project that addresses it are the core activities of the course. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. Enrollment limited to first-year students. SC

* **EVST 0060b, Topics in Environmental Justice** Michael Fotos
This seminar introduces students to key concepts in environmental justice and to a selection of cases representing a wide range of environmental dilemmas. Course readings and discussions impart awareness of the diverse contexts in which problems of environmental justice might be studied, whether historical, geographic, racial, social, economic, political, biological, geophysical, or epistemic. Enrollment limited to first-year students. WR, SO

* **EVST 0080b and EVST 1000b / APHY 0800b and APHY 1000b / ENAS 0800b / EPS 0800b / PHYS 0800b and PHYS 1000b, Energy, Environment, and Public Policy** Daniel Prober
The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non–science majors with strong backgrounds in math and science. Tours are be conducted of major examples of good energy design at Yale, including the Yale Power Plant and Kroon Hall. Students who take this course are not eligible to take APHY 100. Prerequisites: High school chemistry, physics, and Math. Calculus is not required. Enrollment limited to first-year students. QR, SC

EVST 1120a / AMST 1120a / HIST 1120a / HSHM 2040a, American Environmental History Staff
Ways in which people have shaped and been shaped by the changing environments of North America from the nineteenth century to the present. Migration of species and trade in commodities; the impact of technology, agriculture, and industry; the development of resources in the American West and overseas; the conservation and environmental movements; planning and the impact of public policies; automobiles, highways, and urban growth; toxic chemicals, radiation, and environmental justice; climate change and energy transitions. WR, HU 0 Course cr

EVST 1144a / EDST 1144a / EDST 144 / ER&M 2511a / EVST 144 / SOCY 1700a, Race, Ethnicity, and Immigration Staff
Exploration of sociological studies and theoretical and empirical analyses of race, ethnicity, and immigration, with focus on race relations and racial and ethnic differences in outcomes in contemporary U.S. society (post-1960s). Study of the patterns of educational and labor market outcomes, incarceration, and family formation of whites, blacks (African Americans), Hispanics, and Asian Americans in the United States, as well as immigration patterns and how they affect race and ethnic relations. SO 0 Course cr

EVST 2000b / ARCH 2000b / URBN 2000b, Scales of Design Bimal Mendis
Exploration of architecture and urbanism at multiple scales from the human to the world. Consideration of how design influences and shapes the material and conceptual spheres through four distinct subjects: the human, the building, the city, and the world. Examination of the role of architects, as designers, in constructing and shaping the inhabited and urban world. Lectures, readings, reviews and four assignments that address the spatial and visual ramifications of design.Not open to first-year students. Required for all Architecture majors. HU

EVST 2090b / HIST 1765b / HSHM 2090b, Making Climate Knowledge Deborah Coen
This is a course about *how* humans have come to know what we know about our impacts on the earth's climate and our vulnerability to climate change. When did humans first *know* that their actions, in the aggregate, could transform the planet? Did scientists bear responsibility to warn of these consequences? In what ways has the modern science of climate both appropriated and undermined traditional and indigenous forms of climate knowledge? Students learn to work with the methods of history of science: we analyze science as a social and material process bound to the cultural and epistemological particularities of its historical context, and we examine the political dimensions of historical narratives about the emergence of the theory of global warming. Via hands-on experience with Yale's historical collections, students learn to analyze maps, artifacts, and instruments as historical sources. They also gain familiarity with the methods of environmental history, learning to attend to historical evidence of shifting relationships between humans and non-humans. Finally, students become more attuned to the evidence of climate change around them and more confident in their ability to make climate knowledge for themselves. HU

EVST 2200a / EEB 2220a, General Ecology Staff
The theory and practice of ecology, including the ecology of individuals, population dynamics and regulation, community structure, ecosystem function, and ecological interactions at broad spatial and temporal scales. Topics such as climate change,

fisheries management, and infectious diseases are placed in an ecological context. Prerequisite: MATH 112 or equivalent. SC 0 Course cr

EVST 2206a / HIST 1727a / HSHM 2010a / HUMS 1060a / PHYS 1060a, Sustainable Energy: Physics and History
Students explore the physical logic of energy and power in parallel with the histories of technology for energy exploitation and economic theories of sustainability on the path to modernity. They learn the fundamentals of quantitative analysis of contemporary and historical energy harvesting, its carbon intensity, and climate impact. They also gain an understanding of the historical underpinnings of the current global energy status quo and its relationship to economic theories of sustainability. Mathematical proficiency with algebra is assumed. Students from all academic interests and experiences are welcome in the course. QR, SC, SO 0 Course cr

* **EVST 2228a / CPLT 3450a / HIST 1759a / HUMS 2228a, Climate Change and the Humanities** Katja Lindskog
What can the Humanities tell us about climate change? The Humanities help us to better understand the relationship between everyday individual experience, and our rapidly changing natural world. To that end, students read literary, political, historical, and religious texts to better understand how individuals both depend on, and struggle against, the natural environment in order to survive. HU

* **EVST 2232a / SPAN 2155a, Ecological Mindfulness: Poetics and Praxis in the Spanish-Speaking World** Sarah Glenski
What is our relationship with nature? What constitutes ecological mindfulness? Does the practice of ecological mindfulness constitute a poetics? Is art a form of ecological mindfulness? These are some of the questions that we consider as we examine the concept of ecological mindfulness as an intersection of poetics and praxis. Throughout the semester, we explore a wide array of artistic expressions (essays, short stories, sound, poetry, photography, painting, etc.), which allows us to both appreciate and interrogate the many ways in which interactions with nature are depicted and performed in different Hispanophone cultures. Our analysis of these texts is complemented by carrying out and reflecting upon our own practice of ecological mindfulness. This course is taught in Spanish. Prerequisite: SPAN 140, or SPAN 142, or SPAN 145, or equivalent L5, HU

* **EVST 2234La, Field Science: Environment and Sustainability** Kealoha Freidenburg
A field course that explores the effects of human influences on the environment. Analysis of pattern and process in forested ecosystems; introduction to the principles of agroecology, including visits to local farms; evaluation of sustainability within an urban environment. Weekly field trips and one weekend field trip. SC

* **EVST 2290b / URBN 3307b, Geographic Information Systems** Jill Kelly
A practical introduction to the nature and use of geographic information systems (GIS) in environmental science and management. Applied techniques for the acquisition, creation, storage, management, visualization, transformation, analysis, and synthesis of cartographic data in digital form.

* **EVST 3212a / EP&E 4390a / PLSC 3217a, Democracy and Sustainability** Michael Fotos
Democracy, liberty, and the sustainable use of natural resources. Concepts include institutional analysis, democratic consent, property rights, market failure, and common

pool resources. Topics of policy substance are related to human use of the environment and to U.S. and global political institutions. WR, SO

*** EVST 3224b / ENGL 3467b / ENGL 418, Writing About The Environment** Staff
Exploration of ways in which the environment and the natural world can be channeled for literary expression. Reading and discussion of essays, reportage, and book-length works, by scientists and non-scientists alike. Students learn how to create narrative tension while also conveying complex—sometimes highly technical—information; the role of the first person in this type of writing; and where the human environment ends and the non-human one begins. Previously ENGL 418.. Admission by permission of the instructor only. Students interested in the course should email the instructor at alan.burdick@gmail.com with the following information: 1.) A few paragraphs describing your interest in taking the class. 2.) A non-academic writing sample that best represents you. WR

*** EVST 3255a / PLSC 3220a, Environmental Law and Politics** John Wargo
We explore relations among environmental quality, health, and law. We consider global-scale *avoidable* challenges such as: environmentally related human illness, climate instability, water depletion and contamination, food and agriculture, air pollution, energy, packaging, culinary globalization, and biodiversity loss. We evaluate the effectiveness of laws and regulations intended to reduce or prevent environmental and health damages. Additional laws considered include rights of secrecy, property, speech, worker protection, and freedom from discrimination. Comparisons among the US and EU legal standards and precautionary policies will also be examined. Ethical concerns of justice, equity, and transparency are prominent themes. SO

*** EVST 3303a, Environmental Data Visualization for Communication** Simon Queenborough
Welcome to the Information Age. It is much easier to generate and access data than ever before. Yet, our ability to manage, analyze, understand, and communicate all this data is extremely limited. Visualization is a powerful means of enhancing our abilities to learn from data and to communicate results to others, especially when informed by insights into human behavior and social systems. Developing the quantitative skills necessary for analyzing data is important, but for addressing complex and often urgent environmental problems that involve diverse audiences: understanding how to effectively communicate with data is equally essential for researchers, policymakers, and the public alike. This course is for students who wish to gain an understanding of the principles, tools, and techniques needed to communicate effectively with data. Class topics include collecting, cleaning, and managing data, exploring and analyzing data, choosing and using chart types, formatting charts, human perception and biases, principles of design, and visual communication. We work with various software for managing data and creating charts, including data cleaning (OpenRefine), spreadsheets and charts (Excel, Sheets), presentation (Powerpoint, Slides), statistics and charts (base R, ggplot), charts (DataWrapper, Tableau), GIS (ArcGIS), and other tools to develop visualizations using diverse datasets. A basic understanding of descriptive statistics is expected. Programming or coding experience is not required.

*** EVST 3308a, Sustainability Implementation: Change Management in Institutional Settings** Sara Smiley Smith and Lindsay Crum
Yale's formal sustainability efforts are nearing the two-decade mark, with the Office of Sustainability established in 2005, but the work to make the campus more sustainable

has been going on far longer. From sending food scraps to pig farmers in the 1800's, to responding to energy crises and crashes with infrastructure changes, to establishing early recycling programs in the 1980's, the University's work has deep roots, if not always the comprehensive impact some would desire. This course provides students with the opportunity to learn about this long history of effort to improve the University's sustainability, and engage in the real act of change management in current efforts on campus. Exploring change management theory and learning from many on campus experts, students work in groups bringing a diversity of experiences and knowledge to the table to tackle real and wicked problems in our midst. In taking on these timely projects, students have the opportunity to tangibly impact Yale's ongoing efforts to fully embrace sustainable operations while experiencing the friction, joy, disappointment, learning, and challenge that are all part of working to make real change happen in complex systems.

* **EVST 3323a, Wetlands Ecology Conservation & Management** Kealoha Freidenburg
Wetlands are ubiquitous. Collectively they cover 370,000 square miles in the United States and globally encompass more than 5 million square miles. Most points on a map are less than 1 km from the nearest wetland. Yet wetlands are nearly invisible to most people. In this course we explore wetlands in all of their dimensions, including the critical services they provide to other systems, the rich biodiversity they harbor, their impact on global climate, and the links by which they connect to other systems. Additionally, wetlands are lynchpin environments for scientific policy and regulation. The overarching aim of the course is to connect what we know about wetlands from a scientific perspective to the ways in which wetlands matter for people. SC

EVST 3342La / EEB 3343La, Ecosystem Measurements for Conservation and Restoration Annise Dobson
This course familiarizes students with how ecology is used on the ground for conservation. It is structured in two parts: The first part of the class will be dedicated to active hands-on learning where students obtain formal training in broad range of field and lab methods and analyses used in ecological field research. Topics covered include carbon stock measurement, biodiversity assessment, utilization of digital conservation resources, experimental design, sampling methodology, and statistical analysis. The course includes intensive field exercises focused on forest measurements and soil analysis that ecologists use to understand ecosystem function. The second component of the course allows students to use these skills to design, conduct, analyze and present data in the form of a rapid ecological assessment or group research project on a local property of conservation importance. Prerequisites: BIOL 104 or instructor permission
½ Course cr

* **EVST 3350a, Writing the World** Verlyn Klinkenborg
This is a practical writing course meant to develop the student's skills as a writer. But its real subject is perception and the writer's authority—the relationship between what you notice in the world around you and what, culturally speaking, you are allowed to notice. What you write during the term is driven entirely by your own interest and attention. How you write is the question at hand. We explore the overlapping habitats of language—present and past—and the natural environment. And, to a lesser extent, we explore the character of persuasion in environmental themes. Every member of the class writes every week, and we all read what everyone writes every week. It makes no difference

whether you are a would-be journalist, scientist, environmental advocate, or policy maker. The goal is to rework your writing and sharpen your perceptions, both sensory and intellectual. Enrollment limited to fifteen. WR

EVST 3394a, Climate Change: Simple, Serious, and Solvable Staff
Earth's climate is determined by the balance of radiation inputs and outputs at planetary scale. Greenhouse gases produce a radiation imbalance that forces change. Basic physics and paleoclimate agree that modern changes are enormous. SERIOUS: Impacts of 21st Century climate change on weather, drought, fires, famines, and floods pose the greatest threat to ecosystems in millions of years and the worst threat to the global economy since the Black Death. Worse, the changes are essentially permanent. SOLVABLE: Rapid and complete decolonization of the global energy system is feasible and affordable, but politically difficult. We consider economic, policy, and engineering solutions and finish by examine cultural narratives about solutions. SO o Course cr

* **EVST 3396a or b, Independent Study: Environmental Studies** Michael Fotos
Independent research under the direction of a Yale faculty member on a special topic in Environmental Studies not covered in other courses and not the focus of the senior essay. Permission of the director of undergraduate studies and of the instructor directing the research is required. A proposal approved by the instructor must be submitted to the director of undergraduate studies by the end of the second week of classes. The instructor meets with the student regularly, in person or remotely, typically for an hour a week, and the student writes a final paper or a series of short essays.

* **EVST 3400b / EEB 2275b, Biological Oceanography** Mary Beth Decker
Exploration of oceanic ecosystems and how these environments function as coupled physical/biological systems. Ocean currents and other physical processes determine where nutrients are available to support primary production and where organisms from plankton to top predators occur. Includes discussion of anthropogenic impacts, such as the effects of fishing and climate change on marine ecosystems. Enrollment limited to 35. SC

EVST 3431b, The Physical Science of Climate Change Peter Raymond and Xuhui Lee
The course provides students with core knowledge on the processes controlling the earth's climate system. The first half of the class focuses on the four components of the earth climate system, providing a knowledge base on the atmospheric energy and water budgets and the roles of anthropogenic greenhouse gases, the oceans, land and cryosphere in altering these budgets. Students also learn how to run a climate GCM (general circulation model). The second half of the class focuses on impacts of climate change on a number of societal sectors including natural ecosystems, energy use, water resources, the food system and the built environment. SC

* **EVST 3639a, Food Systems and Climate Services** J. Nicolas Hernandez-Aguilera
Amidst climate change, the need for sustainable solutions in agri-food systems has become increasingly urgent. This course takes an interdisciplinary approach, combining applied economics, management and information systems, policy analysis, and systems thinking to explore the complex interactions within food systems and identify potential solutions. Designed for students from diverse academic and professional backgrounds, the course welcomes those interested in sustainability, food systems, climate management, and policy at both global and community levels, with a particular emphasis on the Global South.

EVST 3650b / MB&B 3650b, Biochemistry and Our Changing Climate Karla Neugebauer
Climate change is impacting how cells and organisms grow and reproduce. Imagine the ocean spiking a fever: cold-blooded organisms of all shapes, sizes and complexities struggle to survive when water temperatures go up 2–4 degrees. Some organisms adapt to extremes, while others cannot. Predicted and observed changes in temperature, pH and salt concentration do and will affect many parameters of the living world, from the kinetics of chemical reactions and cellular signaling pathways to the accumulation of unforeseen chemicals in the environment, the appearance and dispersal of new diseases, and the development of new foods. In this course, we approach climate change from the molecular point of view, identifying how cells and organisms—from microbes to plants and animals—respond to changing environmental conditions. To embrace the concept of "one health" for all life on the planet, this course leverages biochemistry, cell biology, molecular biophysics, and genetics to develop an understanding of the impact of climate change on the living world. We consider the foundational knowledge that biochemistry can bring to the table as we meet the challenge of climate change. Prerequisites: MB&B 300/301 or MB&B 200/MCDB 300 or permission of the instructor. Can be taken concurrently with MB&B 301. SC 0 Course cr

* **EVST 4422a / ANTH 4809 / ER&M 3594a / F&ES 422 / GLBL 4394a, Climate and Society: Perspectives from the Social Sciences and Humanities** Michael Dove
Discussion of the major currents of thought regarding climate and climate change; focusing on equity, collapse, folk knowledge, historic and contemporary visions, western and non-western perspectives, drawing on the social sciences and humanities. WR, SO

* **EVST 4450b, Carbon Containment** Sinead Crotty and Dean Takahashi
As greenhouse gases (GHGs) accumulate in the atmosphere, it is increasingly important to deploy *both* emission reductions *and* carbon dioxide removal (CDR) —together termed 'carbon containment.' A wide range of carbon containment technologies are being worked on today, yet this relatively nascent field must overcome technical, logistical, ethical, and financial challenges before contributing to stabilize the climate at scale. In this course, we examine the need, scale, and timelines for carbon containment as expressed by international climate commitments and corporate climate goals. Then, we examine the scientific foundations for key carbon containment pathways including emission reductions of key short-lived climate pollutants (SLCPs) as well as CDR in biologic, geologic and engineered systems. Finally, we investigate the challenges facing these carbon containment approaches, including siting, commercialization, measuring, and communicating the costs and benefits of these approaches to different audiences. We discuss how carbon containment pathways affect environmental justice concerns and goals in different regions of the US and internationally. Over the course of the semester, students do an investigation of one carbon containment approach, culminating in a report describing key components of the science, economics, social license, and regulatory landscape, and ultimately, a pathway to scale. There are no prerequisites for this course, although familiarity with basic climate science, policy, carbon markets, and GHG emissions inventories is helpful. SC, SO

* **EVST 4469a / ENGL 44459a / MB&B 4590a, Writing about Science, Medicine, and the Environment** Carl Zimmer
Advanced non-fiction workshop in which students write about science, medicine, and the environment for a broad public audience. Students read exemplary work, ranging from newspaper articles to book excerpts, to learn how to translate complex subjects into compelling prose. Admission by permission of the instructor only. Applicants should email the instructor at carl@carlzimmer.com with the following information: 1. One or two samples of nonacademic, nonfiction writing. (No fiction or scientific papers, please.) Indicate the course or publication, if any, for which you wrote each sample. 2. A note in which you briefly describe your background (including writing experience and courses) and explain why you'd like to take the course. Formerly ENGL 459. WR

* **EVST 4630a / AMST 4463a / FILM 4550a / TDPS 4023a, Documentary Film Workshop** Charles Musser
A yearlong workshop designed primarily for majors in Film and Media Studies or American Studies who are making documentaries as senior projects. Seniors in other majors admitted as space permits. RP

* **EVST 4960a or b, Senior Research Project and Colloquium** Staff
Independent research under the supervision of members of the faculty, resulting in a senior essay. Students meet with peers and faculty members regularly throughout the fall term to discuss the progress of their research. Projects should offer substantial opportunity for interdisciplinary work on environmental problems. Seniors in the BS track typically write a two semester senior essay by enrolling in EVST 496 and EVST 496. For the B.A. degree, students most often complete one term of EVST 496, in either the fall or spring semester of their senior year. Students writing the one-term essay in the BA track must also complete an additional advanced seminar in the environment. Two-term senior research projects in the BA track require the permission of the DUS. Single semester essays are permissible also for students completing a double major that involves writing a senior essay in another department or program with permission of the DUS and subject to Yale College academic regulations governing completion of two majors.

Ethics, Politics, & Economics (EP&E)

* **EP&E 3214a, Classics of Ethics, Politics and Economics** Kevin Elliott
This course is designed to explore the moral and theoretical foundations, critiques, and open questions surrounding the social organization of production and governance in modern societies. A key aim of this class is to better understand the moral and philosophical background of market-based distribution, criticisms of it, and how thinkers have tried to make sense of it. HU, SO

* **EP&E 3217a, Classics of EP&E–Intellectual Origins of Liberalism and Conservatism** Gregory Collins
The purpose of this course is to explore the intellectual origins of liberalism and conservatism through an EP&E framework. We discuss the tensions between collective wisdom and individual reason in the early modern period and survey the thought of thinkers in the proto-liberal and proto-conservative traditions, such as Thomas Hobbes and John Locke on sovereignty, individual autonomy, reason, and toleration;

and Robert Filmer, Richard Hooker, and David Hume on order, custom, and utility. Our main object of inquiry, however, is the intellectual division that emerged between supporters and critics of the French Revolution, the historical event that prompted the modern political identities of liberalism and conservatism. Accordingly, we examine the political, moral, and economic theories of the Revolution; reactions to the Revolution from Edmund Burke, Joseph de Maistre, and other counterrevolutionaries; critical responses to their reactions, including those from Thomas Paine, Mary Wollstonecraft, and James Mackintosh; and the impact of this debate on the evolution of liberalism and conservatism in the nineteenth and twentieth centuries in Europe and the United States. Class discussions and readings confront liberal and conservative perspectives on human nature; reason; freedom; tradition; individual rights; religion; the Enlightenment; market economies; democratic participation; and equality. SO

* **EP&E 4224a / ECON 4465a / GLBL 4830a, Debating Globalization** Ernesto Zedillo
Facets of contemporary economic globalization, including trade, investment, and migration. Challenges and threats of globalization: inclusion and inequality, emerging global players, global governance, climate change, and nuclear weapons proliferation. Prerequisite: background in international economics and data analysis. Preference to seniors majoring in Economics or EP&E. SO RP

* **EP&E 4234a / PHIL 3314a, Contemporary Moral and Social Controversies: Freedom, Autonomy, Well-Being** Max Lewis
We are living in a time of moral turmoil. Not only have legal rights we took for granted been overturned (e.g., the right to abortion), but we seem more polarized than ever. In this course, we take a careful and sober look at some of the moral and social controversies that constitute this state of turmoil and polarization. At the heart of the course are debates concerning conflicts between the following rights and values that people in liberal democracies see as sacrosanct, e.g., autonomy (e.g., bodily autonomy), freedom (e.g., free speech and freedom of association), harm prevention, the right to life, and well being. We start by exploring the fundamental theories in morality (e.g., Consequentialism, Deontology, and Rights Theory) and well-being (e.g., Hedonism, Desire-satisfaction, and Objective List views). We then use these theories to critically analyze particular moral and social controversies. In particular, we explore how these theories answer the following questions, "Is abortion morally permissible?", "Is euthanasia morally wrong?", "Should there be limits on free speech? If so, when?", "Should there be limits on what can be bought and sold?", "Can the state be justified in interfering with who gets to parent children?", "How open should state borders be?", "What do we owe the global poor?" SO

* **EP&E 4235b / PHIL 4457b / PLSC 3346b, Recent Work on Justice** Thomas Pogge
In-depth study of one contemporary book, author, or debate in political philosophy, political theory, or normative economics. Focus varies from year to year based on student interest and may include a ground-breaking new book, the life's work of a prominent author, or an important theme in contemporary political thought. HU

* **EP&E 4246a / PLSC 3339a, Participatory Democracy** Amir Fairdosi
What does democracy look like without elections? In this class, we discuss the theory and practice of "participatory" forms of democracy (i.e. those that allow and

encourage citizens to influence policy directly, rather than indirectly through elected representatives). SO

* **EP&E 4250a / PLSC 3462a, The European Union** David Cameron
Origins and development of the European Community and Union over the past fifty years; ways in which the often-conflicting ambitions of its member states have shaped the EU; relations between member states and the EU's supranational institutions and politics; and economic, political, and geopolitical challenges. SO

* **EP&E 4255a / PHIL 3208a, Morality and Relationships** Max Lewis
This course explores the nuances of two kinds of relationships: interpersonal relationships and normative relationships. The course starts with foundational work in relational ethics which connects ethics with moral accountability, e.g., moral demands, claims, blame, apology, forgiveness, etc. With a grasp of these views in place, we turn toward the morality of interpersonal relationships. Interpersonal relationships are a central part of our lives. As social creatures, they are essential for our well-being and the meaningfulness of our lives. But they raise important moral questions. For example, do we have special obligations to our friends, family, or co-national? Are we epistemically permitted to ignore evidence if it indicates that our friend or family has done something wrong? Is there a conflict between what morality requires and what is required for being a good friend or family member? What's wrong or bad about being friends with an immoral person? We also explore psychological and moral aspects of these relationships, e.g., what does loving a person consist of? What reasons do we have to love others? Do we owe our loved ones debts of gratitude? SO

* **EP&E 4256b / ANTH 3807b, Reparation, Repair, Reconciliation: Reckoning with Slavery and Colonialism in Global Perspective** Yukiko Koga
Imperial reckoning for slavery, imperialism, and colonialism has gained new momentum in recent years, from official apologies for colonial violence to reparations lawsuits filed in Asia, Europe, and the US for slavery, genocide, and massacres, to demands for the return of bodily remains and cultural artifacts from established cultural institutions. This seminar explores how these new attempts for belated imperial reckoning are reshaping relations between former empires and their ex-colonies. It approaches imperial reckoning as a site for redressing not only the original violence but also the transitional *injustice* incurred in the process of the unmaking of empire, which calls for post-imperial reckoning. Drawing on examples from recent cases, this course explores what it means to belatedly reckon with imperial violence today. What does it mean to reckon with imperial violence through legal means, decades after the dissolution of empires? What is the role of law in belated redress? How is historical responsibility articulated and by whom? Who is responsible for what, then and now? What are the stakes in reckoning with distant, yet still alive, pasts? Why and how does it matter today for those of us who have no direct experience of imperial violence? This course approaches these questions through an anthropological exploration of concepts such as debt, gift, moral economy, structural violence, complicity and implication, and abandonment. Prerequisites: Instructor permission required. HU, SO

* **EP&E 4259a / ECON 4460a, From Say's Law to the Global Financial Crisis: Thinking about Economic Fluctuations and Instability** Robert Dimand
This course investigates the changing ways in which economic fluctuations and financial and economic instability have been analyzed in the two centuries from the debates at the end of the Napoleonic Wars over Say's Law of Markets and the possibility

of a general glut of commodities through to the Global Financial Crisis and the present state of macroeconomics. Prerequisite: Intermediate Macroeconomics (ECON 2122 or ECON 2126) or permission of the instructor. SO

* **EP&E 4264a, Inequality and Polarization in America** Gregory Collins
This seminar examines how the profound economic and social inequality in the United States interacts with our polarized political environment, and how these forces ultimately shape democratic processes and government policy. Throughout, we analyze the interplay of economic incentives and realities with political behavior and institutions. We pay special attention not just to what we know, but also to how we know it, highlighting contemporary empirical research from political science and economics. Substantively, we cover a constellation of topics at the intersection of these two fields: the relationship of income inequality and wealth concentration to campaign finance, the role of education polarization in determining who runs for office, the legacy of slavery and its relationship to identity politics, and the links between racial, economic, and political segregation across neighborhoods. Other topics include social media and internet news—which receive much of the blame for polarization in the press—the (in)effectiveness of campaign advertising, the determinants of voter turnout, the impact of social movements, and the shifting alliances among business, labor, and the major political parties. Previous courses in econometrics, statistics, and causal inference are suggested.

EP&E 4295a / EP&E 295 / PLSC 2600a, Game Theory and Political Science Staff
Introduction to game theory—a method by which strategic interactions among individuals and groups in society are mathematically modeled—and its applications to political science. Concepts employed by game theorists, such as Nash equilibrium, subgame perfect equilibrium, and perfect Bayesian equilibrium. Problems of cooperation, time-consistency, signaling, and reputation formation. Political applications include candidate competition, policy making, political bargaining, and international conflict. No prerequisites other than high school algebra. Political Science majors who take this course may not count ECON 159 toward the major. QR, SO
o Course cr

* **EP&E 4306a / PLSC 3221a, First Amendment and Ethics of Law** Karen Goodrow
This course addresses the First Amendment and freedom of speech, focusing on the ethical implications of restrictions on free speech, as well as the exercise of free speech. Course topics and discussions include the "fighting words" doctrine, hate speech, true threats, content regulated speech, freedom of speech and the internet, and the so-called "right to be forgotten." By the end of the course, students recognize the role free speech plays in society, including its negative and positive impacts on various segments of society. Students also have an understanding of the competing interests arising from the First Amendment's right to free speech, and can analyze how these competing interests are weighed and measured in the United States as compared with other countries. SO

* **EP&E 4328a / EP&E 328 / PLSC 2509a / S&DS 1720a, YData: Data Science for Political Campaigns** Joshua Kalla
Political campaigns have become increasingly data driven. Data science is used to inform where campaigns compete, which messages they use, how they deliver them, and among which voters. In this course, we explore how data science is being used to design winning campaigns. Students gain an understanding of what data is available

to campaigns, how campaigns use this data to identify supporters, and the use of experiments in campaigns. This course provides students with an introduction to political campaigns, an introduction to data science tools necessary for studying politics, and opportunities to practice the data science skills presented in S&DS 123, YData.
QR

* **EP&E 4334b / PHIL 4455b, Normative Ethics** Shelly Kagan
A systematic examination of normative ethics, the part of moral philosophy that attempts to articulate and defend the basic principles of morality. The course surveys and explores some of the main normative factors relevant in determining the moral status of a given act or policy (features that help make a given act right or wrong). Brief consideration of some of the main views about the foundations of normative ethics (the ultimate basis or ground for the various moral principles). Prerequisite: a course in moral philosophy. HU

* **EP&E 4350a / AFST 3385a / HIST 2391a / HIST 3344a / PLSC 3439a, Pandemics in Africa: From the Spanish Influenza to Covid-19** Jonny Steinberg
The overarching aim of the course is to understand the unfolding Covid-19 pandemic in Africa in the context of a century of pandemics, their political and administrative management, the responses of ordinary people, and the lasting changes they wrought. The first eight meetings examine some of the best social science-literature on 20th-century African pandemics before Covid-19. From the Spanish Influenza to cholera to AIDS, to the misdiagnosis of yaws as syphilis, and tuberculosis as hereditary, the social-science literature can be assembled to ask a host of vital questions in political theory: on the limits of coercion, on the connection between political power and scientific expertise, between pandemic disease and political legitimacy, and pervasively, across all modern African epidemics, between infection and the politics of race. The remaining four meetings look at Covid-19. We chronicle the evolving responses of policymakers, scholars, religious leaders, opposition figures, and, to the extent that we can, ordinary people. The idea is to assemble sufficient information to facilitate a real-time study of thinking and deciding in times of radical uncertainty and to examine, too, the consequences of decisions on the course of events. There are of course so many moving parts: health systems, international political economy, finance, policing, and more. We also bring guests into the classroom, among them frontline actors in the current pandemic as well as veterans of previous pandemics well placed to share provisional comparative thinking. This last dimension is especially emphasized: the current period, studied in the light of a century of epidemic disease, affording us the opportunity to see path dependencies and novelties, the old and the new. SO

* **EP&E 4356a, Constitutional Law and Business Ethics** Gregory Collins
The purpose of this course is to explore how the U.S. Constitution and Supreme Court case law have had an impact on business and commercial activities throughout U.S. history. We first identify provisions of the Constitution that relate to economics and familiarize ourselves with methods of constitutional interpretation, including originalism and living constitutionalism. We then apply this guiding framework to our analysis of key Supreme Court cases that have addressed the Commerce Clause, the Takings Clause, the First Amendment, the Fourteenth Amendment, and a number of other constitutional provisions that relate to commercial exchange and the legal status of corporations. Additional concepts we discuss include the countermajoritarian

difficulty, the rational basis test, strict scrutiny, substantive due process, fundamental rights, disparate impact, public accommodations law, antidiscrimination law, and antitrust law. The guiding question we confront is whether the courts should a.) defer to legislatures in regulating business actors; or b.) overturn democratically enacted laws to protect the economic liberties of individuals.

* **EP&E 4390a / EVST 3212a / PLSC 3217a, Democracy and Sustainability** Michael Fotos

Democracy, liberty, and the sustainable use of natural resources. Concepts include institutional analysis, democratic consent, property rights, market failure, and common pool resources. Topics of policy substance are related to human use of the environment and to U.S. and global political institutions. WR, SO

* **EP&E 4396a / AMST 4469a / PLSC 3238a, American Progressivism and Its Critics** Stephen Skowronek

The progressive reform tradition in American politics. The tradition's conceptual underpinnings, social supports, practical manifestations in policy and in new governmental arrangements, and conservative critics. Emphasis on the origins of progressivism in the early decades of the twentieth century, with attention to latter-day manifestations and to changes in the progressive impulse over time. SO

* **EP&E 4399a / AMST 3365a / ER&M 3695a / FILM 2680, Platforms and Cultural Production** Julian Posada

Platforms—digital infrastructures that serve as intermediaries between end-users and complementors—have emerged in various cultural and economic settings, from social media (Instagram), and video streaming (YouTube), to digital labor (Uber), and e-commerce (Amazon). This seminar provides a multidisciplinary lens to study platforms as hybrids of firms and multi-sided markets with unique history, governance, and infrastructures. The thematic sessions of this course discuss how platforms have transformed cultural production and connectivity, labor, creativity, and democracy by focusing on comparative cases from the United States and abroad. The seminar provides a space for broader discussions on contemporary capitalism and cultural production around topics such as inequality, surveillance, decentralization, and ethics. Students are encouraged to bring examples and case studies from their personal experiences. HU, SO

* **EP&E 4478b / PHIL 4450b, The Problem of Evil** Keith DeRose

The challenge that evil's existence in the world poses for belief in a perfectly good and omnipotent God. The main formulations of the problem of evil; proposed ways of solving or mitigating the problem and criticism of those solutions. Skeptical theism, the free-will defense, soul-making theodicies, and doctrines of hell. HU

* **EP&E 4490b / CGSC 4260b / PHIL 4426b / PSYC 4220b, The Cognitive Science of Morality** Joshua Knobe

Introduction to the emerging field of moral cognition. Focus on questions about the philosophical significance of psychological findings. Topics include the role of emotion in moral judgment; the significance of character traits in virtue ethics and personality psychology; the reliability of intuitions and the psychological processes that underlie them. HU

* **EP&E 4491a, The Senior Essay** Gregory Collins
A one-term senior essay. The essay should fall within the student's area of concentration. If no appropriate seminar is offered in which the essay might be written, the student, in consultation with the director of undergraduate studies, should choose an appropriate member of the faculty to supervise the senior essay. Students must obtain the signature of the faculty member supervising their independent work on an Independent Study Form (available from the Ethics, Politics, and Economics registrar's office). This form must be submitted to the director of undergraduate studies at the time the student's class schedule is submitted.

* **EP&E 4492a and EP&E 4493a, The Yearlong Senior Essay** Gregory Collins
A two-term senior essay. The essay should fall within the student's area of concentration. The student, in consultation with the director of undergraduate studies, should choose an appropriate member of the faculty to supervise the senior essay. Students must obtain the signature of the faculty member supervising their independent work on an Independent Study Form (available from the Ethics, Politics, and Economics registrar's office). This form must be submitted to the director of undergraduate studies at the time the student's class schedule is submitted.

Ethnicity, Race, & Migration (ER&M)

* **ER&M 0581a / MUSI 0081a / SOCY 0074a, Race and Place in British New Wave, K-Pop, and Beyond** Grace Kao
This seminar introduces you to several popular musical genres and explores how they are tied to racial, regional, and national identities. We examine how music is exported via migrants, return migrants, industry professionals, and the nation-state (in the case of Korean Popular Music, or K-Pop). Readings and discussions focus primarily on the British New Wave (from about 1979 to 1985) and K-Pop (1992–present), but we also discuss first-wave reggae, ska, rocksteady from the 1960s–70s, British and American punk rock music (1970s–1980s), the precursors of modern K-Pop, and have a brief discussion of Japanese City Pop. The class focuses mainly on the British New Wave and K-Pop because these two genres of popular music have strong ties to particular geographic areas, but they became or have become extremely popular in other parts of the world. We also investigate the importance of music videos in the development of these genres. Enrollment limited to first year students. SO

* **ER&M 1539a / AMST 0039a / ENGL 0839a, Latinx Literature Aside the Law** Joseph Miranda
How has Latinx identity emerged through and against the law? From the suspension of Puerto Rican sovereignty to the contemporary proliferation of ethnic studies bans, the state has used the law to delimit Latinx to transparent or static categories of irregular "citizen," "refugee," and "migrant." If conventional thinking assumes that art only responds to the law in protest or affirmation of the status quo, this seminar introduces students to the ways Latinx literature engages, resists, and disidentifies with the law as it delineates national belonging. We ask how do Latinx creative expressions expand the notions of citizenship, nation, and family beyond their raced, classed, and gendered origins to imagine new futures. Through attention to contemporary tv, film, novels, and poetry, we examine how Latinx artists build alternative forms of thriving collective life in forms of mutual aid, queer kinship, party, and protest. Works up for discussion include those by Justin Torres, Raquel Salas Rivera, and the television

show *Vida*. Drawing inspiration from these texts, students collaborate on podcasts, write analytical essays, and complete other critical and creative projects. Enrollment limited to first-year students. WR, HU

* **ER&M 1638b / ARCH 3109b / WGSS 3334b, Making the Inclusive Museum: Race, Gender, Disability and the Politics of Display** Joel Sanders

BLM and COVID-19 have underscored the imperative for public institutions like art museums to reckon with a longstanding dilemma: museum architecture, working in relationship with the art it displays, perpetuation of white supremacy, heteronormativity, and ableism. This seminar uses the resources of the Yale University Art Gallery and the Yale Center for British Art to situate this contemporary challenge in a cultural and historical context by tracing the intertwined histories of art and gallery architecture from the 16th century to today. Looking back allows us to imagine alternative futures: we consider the work of contemporary scholars, artists, designers, and public health experts who are developing strategies for making 21st-century museums inclusive environments that promote multi-sensory experiences among people of different races, genders, and abilities. Instructor permission is required based on the submission of an Expression of Interest with the following info: Name, Class year, Major/Concentration, Email and a paragraph describing relevant experiences that would allow you to make a meaningful contribution to the class. HU RP

* **ER&M 1670a / LING 1070a, Language Endangerment and Revitalization** Edwin Ko

Introduction to language endangerment and language revitalization. This course explores a range of theories and practices that provide the basis by which linguists and language activists aim to revitalize endangered languages in communities around the world. Beginning with surveying the various ways in which the world's linguistic diversity and language ecologies can be assessed and discussing the serious threats to that diversity, why this might be a matter of concern, and the principle of linguistic human rights, the course will narrow toward individual student projects to investigate a minority language in some depth and report on its status with respect to the range of issues discussed in class. WR, SO

ER&M 1678a / LAST 2228a / SPAN 2145a, Borders & Globalization in Hispanophone Cultures Luna Najera

The borders that constitute the geographical divisions of the world are contingent, but they can have enormous ordering power in the lives of people and other beings. Human-made borders can both allow and disallow the flow of people and resources (including goods, knowledge, information, technologies, etc.). Like geographical borders, social borders such as race, caste, class, and gender can form and perpetuate privileged categories of humans that constrain the access of excluded persons to resources, education, security, and social mobility. Thus, bordering can differentially value human lives. Working with the premise that borders are sites of power, in this course we study bordering and debordering practices in the Hispanic cultures of Iberia, Latin America, and North America, from the 1490s to the present. Through analyses of a wide range of texts that may include treatises, maps, travel literature, visual culture, material culture (e.g., currency), law, music, and performance art, students investigate the multiple ways in which social, cultural, and spatial borders are initiated, expressed, materialized, and contested. More broadly, we explore, describe, and trace the entanglements of bordering, globalizations, and knowledge production

in Hispanophone cultures. Some of the questions that will guide our conversations are: What are (social) borders and what are the processes through which they persist? How do the effects of practices that transcend borders (e.g., environmental pollution, deforestation) change our understanding of borders? What can we learn from indigenous peoples' responses to bordering process and globalization? Prerequisite: SPAN 140 or 145, or in accordance with placement results. The course is conducted entirely in Spanish. Readings are available electronically through Canvas and the University Library. To be conducted in Spanish. L5, HU

* **ER&M 1681a / WGSS 2205a, Bodies and Pleasures, Sex and Genders** Eda Pepi This seminar explores questions of embodiment—its pleasures, perplexities, and pains—to interrogate sex, sexuality, and gender as analytical categories. Its aim is to evaluate formative concepts, theories, and debates within feminist, gender, and queer studies, critical race studies, and history. We will consider how terms like "women" and "men," "femininity" and "masculinity," "homosexuality" and "heterosexuality," and "gender" and "transgender" have structured people's experiences and perceptions of bodies—their own and others'. We will interrogate the dynamic and often contested relationship between "gender" and "sexuality," and their constitution through other axes of power and difference, including race, class, and (dis)ability. SO

* **ER&M 1692b / AFAM 2339b / AMST 4461b / EDST 2209b / WGSS 2202b, Identity, Diversity, and Policy in U.S. Education** Craig Canfield
Introduction to critical theory (feminism, queer theory, critical race theory, disability studies, trans studies, Indigenous studies) as a fundamental tool for understanding and critiquing identity, diversity, and policy in U.S. education. Exploration of identity politics and theory, as they figure in education policy. Methods for applying theory and interventions to interrogate issues in education. Application of theory and interventions to policy creation and reform. EDST 1110 recommended. WR, HU

ER&M 2000a, Introduction to Ethnicity, Race, and Migration Staff
Historical roots of contemporary ethnic and racial formations and competing theories of ethnicity, race, and migration. Cultural constructions and social practices of race, ethnicity, and migration in the United States and around the world. HU, SO
o Course cr

* **ER&M 2400a, Antifascist Traditions** Staff
This course is a study of antifascist movements globally from the WWI period to the present. As fascism first arose as a movement in the WWI period, antifascist resistance likewise emerged as a transnational challenge to fascist power. Because fascists vilified and targeted for expulsion or extermination supposed "outsiders" and "undesirables" based on categories such as race, ethnicity, citizenship status, nationality, religion, sexuality, etc., people united along these lines to defend themselves from repression and to fight for freedom. In this course students will explore histories of various antifascist traditions globally. HU o Course cr

ER&M 2511a / EDST 1144a / EDST 144 / EVST 1144a / EVST 144 / SOCY 1700a, Race, Ethnicity, and Immigration Staff
Exploration of sociological studies and theoretical and empirical analyses of race, ethnicity, and immigration, with focus on race relations and racial and ethnic differences in outcomes in contemporary U.S. society (post-1960s). Study of the patterns of educational and labor market outcomes, incarceration, and family formation

of whites, blacks (African Americans), Hispanics, and Asian Americans in the United States, as well as immigration patterns and how they affect race and ethnic relations. SO o Course cr

ER&M 2519a / HIST 1219a / JDST 200 / JDST 2000a / MMES 1149a / RLST 1480a, Jews and the World: From the Bible through Early Modern Times Ivan Marcus
A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings. Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP o Course cr

ER&M 2534a / AFAM 2150a / HIST 1131a / HSHM 2520a, History of Anti-Black Racism and Medicine Staff
The course traces how anti-Black racism shaped the development of western medicine in the Americas. It examines how ideas of anti-Blackness shaped the work of health practitioners and the experiences of patients. It engages the emergence of racial science and scientific racism, and how they contributed to the production of medical knowledge. More importantly, it centers the voices and experiences of Black people, and the various ways challenged racism through knowledge production and activism. It also addresses the enduring legacies of anti-Black racism in medical practice, and its impact on health inequality. HU o Course cr

ER&M 2541b / ANTH 1840b / SOCY 1840b, The Corporation Douglas Rogers
Survey of the rise, diversity, and power of the capitalist corporation in global contexts, with a focus on the 20th and 21st centuries. Topics include: the corporation as legal entity and the social and cultural consequences of this status; corporations in the colonial era; relationships among corporations, states, and non-governmental organizations in Western and non-Western contexts; anti-corporate critique and response; corporate social responsibility; and race, gender, and indigeneity. HU, SO o Course cr

ER&M 2568a / AFST 2170a / LAST 1170a / PORT 2170a, A Luta Continua: African, Asian, and Indigenous Responses to Coloniality in the Lusophone World Kevin Ennis
What did it mean to be anticolonial in the era of revolution against the Portuguese Empire, and what does it mean today in the twenty-first century across the Portuguese-speaking world? In this course we examine the reverberations of anticolonial movements in Portuguese-speaking African and Asian territories, as well as in Indigenous movements in Brazil. Focusing on political, social, and cultural dimensions of emancipation, we ask: How have African, Asian, and Indigenous writers and artists imagined emancipatory endeavors for their peoples, their countries, and their worlds? What is the role of cultural expression in world-sharing and world-building in response to centuries of colonialism and its legacies? This course also aims to further develop communicative proficiency in Portuguese and enhance knowledge of the diverse cultures of the Portuguese-speaking world. Prerequisite: PORT 140, or equivalent in placement. L5, HU

ER&M 2682a / AMST 2272a / HIST 11183a / WGSS 2272a, Asian American History, 1800 to the Present Staff
An introduction to the history of East, South, and Southeast Asian migrations and settlement to the United States from the late eighteenth century to the present. Major themes include labor migration, community formation, U.S. imperialism, legal exclusion, racial segregation, gender and sexuality, cultural representations, and political resistance. HU o Course cr

* **ER&M 3000a / AMST 2262a, Comparative Ethnic Studies** Ximena Lopez Carrillo
Introduction to the methods and practice of comparative ethnic studies. Examination of racial formation in the United States within a transnational framework. Legacies of colonialism, slavery, and racial exclusion; racial formation in schools, prisons, and citizenship law; cultural politics of music and performance; social movements; and postcolonial critique. SO

* **ER&M 3012a / AMST 3302a / HSHM 4930a / WGSS 3312a, Technology, Race and Gender** Kalindi Vora
In this course, we discuss technology and the politics of difference through a survey of topics including artificial intelligence, digital labor (crowdsourcing), and robotics and computer science. Materials for study include humanistic and social scientific critique, ethnographies of technology, technical writing and scientific papers, as well as speculative art practices including design, visual art and fiction. What assumptions and politics of imagination govern the design and development of new technologies? What alternative imaginaries, politics, or even speculations, can be identified with a feminist analytic lens? The seminar also includes a practicum component where we practice the politics of speculation through writing and design projects. To do this we study everything from active STEM projects at Yale to speculative fiction and film to think about how structures of race, gender, sexuality, ability, nation, and religious difference inform how we "speculate" or imagine the future through the ways we design and build technological worlds in practice and in fiction. HU, SO

* **ER&M 3013a / PSYC 3712a, Native American Mental Health** Mark Beitel and Christopher Cutter
Issues of health policy, research, and service delivery in Native American communities, with a focus on historical antecedents that shape health outcomes and social policy for indigenous communities. Urgent problems in health and wellness, with special attention to Native American mental health. The roles of the Indian Health Service, state and local agencies, and tribal health centers; comparison of Native American and European American conceptions of health and illness. SO

* **ER&M 3016a, Indigenous Food Sovereignty** Hi'ilei Hobart
What does it mean to be food sovereign? Are contemporary American diets colonial? This course takes a comparative approach to understanding how and why food is a central component of contemporary sovereignty discourse. More than just a question of eating, Indigenous foodways offer important critiques of, and interventions to, the settler state: food connects environment, community, public health, colonial histories, and economics. Students theorize these connections by reading key works from across the fields of critical indigenous studies, food studies, philosophy, history, and anthropology. In doing so, we question the potentialities of enacting food sovereignty within the settler state, whether dietary decolonization is possible in the so-called age of the Anthropocene, and the limits of working within and against today's legacies of

the colonial food system. Students previously enrolled in ER&M 040 are not eligible to enroll in this course. HU, SO

* **ER&M 3024a / WGSS 325, Asian Diasporas since 1800** Quan Tran
Examination of the diverse historical and contemporary experiences of people from East, South, and Southeast Asian ancestry living in the Americas, Australia, Africa, the Middle East, Asia, and Europe. Organized thematically and comparative in scope, topics include labor migrations, community formations, chain migrations, transnational connections, intergenerational dynamics, interracial and ethnic relations, popular cultures, and return migrations. HU, SO

* **ER&M 3025a, Refugeturisms** Quan Tran
This interdisciplinary course turns to refugees not only as remnants and survivors of past and present violence, destruction, and displacement, but as figures of many possible futures. The neologism combines "refugee" and "futurisms" to underscore both the limitations of existing frameworks about refugees and gestures toward emerging formulations and formations. Temporally, geographically, planetarily expansive and fluid, this course is inspired by the growing field of critical refugee studies and the rich traditions of Afro-futurism, Indigenous futurism, Asian futurism, and Latinx futurism. It draws on language, history, philosophy, theology, literature, art, and film to explore what it means to be human amid and in anticipation of different kinds of refuge-seeking futures. HU

* **ER&M 3030a / RLST 3130a, Islam in Africa** Gana Ndiaye
Islam is the dominant religion in many African nations. Countries such as Libya, Comoros, and Western Sahara have Muslim populations exceeding 99%. In Senegal, over 95% of the population adheres to Islam, while more than 79% of Egyptians identify as Muslim. Nigeria has the largest Muslim population on the continent, with over 100 million Muslims. This course focuses on the histories, politics, and cultures of Muslim Africa. We examine the spread of Islam across the continent from the 7th century through trade, education, and jihad. Drawing primarily from anthropology, we explore the impact of faith on governance and social structures, as well as its interactions with other religious traditions on the continent. By the end of the course, students will: a) learn about key issues in the study of Islam in Africa, including Islam noir, Africanization of Islam, Ajami, and lived Islam, b) develop tools for studying how Africans on the continent and the diaspora practice Islam in various contexts and time periods, and c) acquire research skills for studying Islam ethnographically. HU, SO

* **ER&M 3044a / SOCY 3044a / URBN 3305a, Informal Cities** Leigh-Anna Hidalgo
The informal sector is an integral and growing part of major global cities. With a special focus on the context of U.S. cities, students examine where a burgeoning informality is visible in the region's everyday life. How planners and policymakers address informality is an important social justice challenge. But what is the informal sector, or urban informality, or the informal city? This class addresses such questions through a rigorous examination of the growing body of literature from Sociology, Latinx Studies, Urban Planning, and Geography. We reflect on the debates and theories in the study of informality in the U.S. and beyond and gain an understanding of the prevalence, characteristics, rationale, advantages and disadvantages, and socio-spatial implications of informal cities. More specifically, we examine urban informality in work

—examining street vendors, sex workers, and waste pickers—as well as housing, and the built environment. SO

* **ER&M 3046a / ENGL 2846a, Critical Reading Methods in Indigenous Literatures** Tarren Andrews

This course focuses on developing critical readings skills grounded in the embodied and place-based reading practices encouraged by Indigenous literatures. Students are expected to think critically about their reading practices and environments to consciously cultivate place-based reading strategies across a variety of genres including: fiction and non-fiction, sci-fi, poetry, comic books, criticism, theory, film, and other new media. Students are required to keep a reading journal and regularly present critical reflections on their reading process, as well as engage in group annotations of primary and secondary reading materials. This course is offered during the fall and spring term and may be taken both terms for credit. During the fall term the focus is on Indigenous literatures and new media from North America produced primarily in the 21st century. Critical readings include some historical context, both pre- and post-contact, as well as Indigenous literary theory. During the spring term, the focus becomes Indigenous literatures and games in a global context with emphasis on Indigenous land relations and ecocriticism across the 20th and 21st centuries. WR, HU

* **ER&M 3083a / SOCY 3843a, Central Americans in the U.S.** Leigh-Anna Hidalgo and Katy Maldonado Dominguez

This course is an interdisciplinary survey of the social, historical, political, economic, educational, and cultural experiences of Central American immigrants and their children in the United States. The primary objective of the course is to introduce students to several contemporary experiences and issues in the U.S. Central American community. Focusing mostly on Guatemalan, Honduran, and Salvadoran immigrants —the three largest groups in the United States—we explore the social structures that constrain individuals as well as the strategies and behaviors immigrants and their communities have taken to establish their presence and make a home in U.S. society and stay connected to their countries of origin. Students gain a critical understanding of Central American identities, particularly as these have been constructed through the intersection of race, ethnicity, gender, sexuality, and legal status. SO

* **ER&M 3304a / AMST 3304a / ANTH 3304a / HUMS 3304a / SOCY 3104a, Ethnography & Journalism** Madiha Tahir

While each is loathed to admit it, journalism and ethnography are cousins in some respects interested in (albeit distinct) modes of storytelling, translation, and interpretation. This methods course considers these shared grounds to launch a cross-comparative examination. What can the practies of each field and method—journalism and ethnography—tell us about the other? How do journalists and ethnographers engage ideas about the truth? What can they learn from each other? Students spend the first four weeks studying journalistic methods and debates before shifting to ethnographic discussions, and finally, comparative approaches to writing; data and evidence; experience and positionality. HU, SO

* **ER&M 3511a / AMST 4481a / ENGL 4811a, The Native American Novel** Lloyd Kevin Sy

This course explores the evolution of the Native American novel, tracing its development from *The Life and Adventures of Joaquín Murieta* (1854) to contemporary works. We will examine how Indigenous writers have used the novel to engage with

themes such as sovereignty, memory, land, identity, assimilation, and storytelling as resistance. Readings may include works by John Rollin Ridge, Zitkála-Šá, D'Arcy McNickle, N. Scott Momaday, Leslie Marmon Silko, Louise Erdrich, Gerald Vizenor, and Tommy Orange. Through close reading and critical analysis, we will consider how Native novelists navigate history, genre, and literary form to challenge dominant narratives. None WR, HU

* **ER&M 3530a / AMST 3303a / EP&E 247 / FILM 2980a / SAST 2620a, Digital War** Madiha Tahir

From drones and autonomous robots to algorithmic warfare, virtual war gaming, and data mining, digital war has become a key pressing issue of our times and an emerging field of study. This course provides a critical overview of digital war, understood as the relationship between war and digital technologies. Modern warfare has been shaped by digital technologies, but the latter have also been conditioned through modern conflict: DARPA (the research arm of the US Department of Defense), for instance, has innovated aspects of everything from GPS, to stealth technology, personal computing, and the Internet. Shifting beyond a sole focus on technology and its makers, this class situates the historical antecedents and present of digital war within colonialism and imperialism. We will investigate the entanglements between technology, empire, and war, and examine how digital war—also sometimes understood as virtual or remote war—has both shaped the lives of the targeted and been conditioned by imperial ventures. We will consider visual media, fiction, art, and other works alongside scholarly texts to develop a multidiscpinary perspective on the past, present, and future of digital war. none HU, SO

* **ER&M 3535a / FREN 4160a / WGSS 4416a, Social Mobility and Migration** Morgane Cadieu

The seminar examines the representation of upward mobility, social demotion, and interclass encounters in contemporary French literature and cinema, with an emphasis on the interaction between social class and literary style. Topics include emancipation and determinism; inequality, precarity, and class struggle; social mobility and migration; the intersectionality of class, race, gender, and sexuality; labor and the workplace; homecomings; mixed couples; and adoption. Works by Nobel Prize winner Annie Ernaux and her peers (Éribon, Gay, Harchi, Linhart, Louis, NDiaye, Taïa). Films by Cantet, Chou, and Diop. Theoretical excerpts by Berlant, Bourdieu, and Rancière. Students will have the option to put the French corpus in dialogue with the literature of other countries. Conducted in French. HU

* **ER&M 3536a / AMST 2233a / HIST 2196a / WGSS 2235a, Another "Other"—Introducing Critical Theories and Histories of Disability** Jiya Pandya

What is disability? How has its definition changed over time? How do people "become" disabled and how does one inhabit a disabled body? In what ways has the disabled body become a site for enacting imperial, national, and resistant politics? Where and how are alternate, radical visions of health being developed? This introductory course in Disability Studies poses answers to these and other related questions through an overview of key texts and debates in the growing field of disability studies. Students will learn about the transnational history of disability and disability rights, think about the intersections of disability, race, sexuality, gender, and citizenship, and engage with questions of accessibility and activism that already exist in spaces around you. This course, composed of three

modules on "disability," "disidentifications" with disability, and "disability justice" and "health liberation," is meant to be both an academic overview of a field and a toolkit for advocacy. As we reckon with the longer impacts of COVID-19 and process what it means to live life during and after a global pandemic, it makes most sense for us to turn to those who have reckoned with what it means to live in "crisis," to inhabit a body that is almost-always at "risk," and to build creative forms of care and community. We will spend significant time with disabled writers, artists, and scholars who offer insight and memory about interactions with and between medicine, war, design, technology, sexuality, race, and imperialism. none

* **ER&M 3556a / AMST 3325a / WGSS 1135a, Latina.x.e Feminist Archives** Deb Vargas

The course introduces students to Latina/x/e feminist archives. We focus on historical and contemporary writings by and about Chicana, Puerto Rican, Central American, and other Latina/x/e feminist writers and activists. The course draws from interdisciplinary scholarship addressing the intellectual landscape of Latina/x/e and critical race feminist theories and social movement activist organizing. While this course approaches Latina/x/e feminist theories and activism as often having emerged in relation to U.S. nation-making projects we will consider this work with the understanding that projects of Latina/x/e feminism should be understood as cross-border, transnational, and multi-scaler critiques of nation-state violence. HU

* **ER&M 3561a / AMST 3361a, Comparative Colonialisms** Lisa Lowe

Settler colonialism, slavery, racialized immigration, and imperial war have been integral to the emergence of the U.S. nation, state, and economy, and the consequences of these histories continue today. In this interdisciplinary undergraduate seminar, we examine the relevance of these historical and ongoing formations to the founding and development of the United States, giving attention to the independence of each, as well as to their differences, convergences, and contestations. We consider the strengths and limits of different analytic frames for understanding these histories of colonialism, enslavement, capitalism, and empire. We approach the study through readings in history, anthropology, political economy, literature, arts, and other materials. HU

* **ER&M 3567b / AMST 4447b / EDST 2270b, Contemporary Native American K-12 and Postsecondary Educational Policy** Matthew Makomenaw

This course explores Native American educational policy issues, programming, funding, and success. Native American representation in policy conversations is often incomplete, complicated, or relegated to an asterisk resulting in a lack of resources, awareness, and visibility in educational policy. This course examines the challenges and issues related to Native education; however, the impetus of this course centers on the resiliency, strength, and imagination of Native American students and communities to redefine and achieve success in a complex and often unfamiliar educational environment. EDST 1110 recommended. SO

* **ER&M 3570a / AMST 4441a / HIST 3130a, Indians and the Spanish Borderlands** Ned Blackhawk

The experiences of Native Americans during centuries of relations with North America's first imperial power, Spain. The history and long-term legacies of Spanish colonialism from Florida to California. WR, HU

* **ER&M 3574a / AFAM 3675a / AMST 3355a / FREN 3675a / LAST 2675a, Haiti Writes I** Marlene Daut and Kaiama Glover

From nineteenth-century antislavery pamphleteering to accounts of ecological catastrophe in 21st-century fiction, Haitian literature has resounded across the globe since the nation's revolutionaries declared independence in 1804. Starting with pre-revolutionary writing, including the emergence of Haitian Creole letters, moving through a long, largely francophone nineteenth century, to present-day Haitian writing in the English language, this two-semester exploration of Haitian literature presents the political, cultural, and historical frameworks necessary to comprehend Haiti's vast literary output. Whether writing in Haiti or its wide-ranging diasporas, Haitian authors have boldly contributed to pressing conversations in global letters while reflecting Haiti's unique cultural and historical experiences. Considering an expansive array of poets, playwrights, and novelists—such as Baron de Vastey, Juste Chanlatte, Demesvar Delorme, Edwidge Danticat, René Depestre, Kettly Mars, Dany Laferrière, and Évelyne Trouillot—this course engages students in a fresh examination of Haiti's richly polyglot and transnational literary tradition that spans more than two centuries.

* **ER&M 3592a / HSAR 4492a / SPAN 4600a, Visual Encounters in the Early Modern Atlantic** Catalina Ospina and Lisa Voigt

This course examines the visual, material, and human flows that connected Africa, Europe, and the Americas between 1450 and 1850 and gave its contours to the early modern Atlantic World. Students explore the role of the visual in key institutions and phenomena that emerged in the circum-Atlantic and continue to cast their long shadow over the contemporary world. Topics include: colonialism, the slave trade, blackness and indigeneity, scientific exploration, religious encounters, and revolt. HU

* **ER&M 3594a / ANTH 4809 / EVST 4422a / F&ES 422 / GLBL 4394a, Climate and Society: Perspectives from the Social Sciences and Humanities** Michael Dove

Discussion of the major currents of thought regarding climate and climate change; focusing on equity, collapse, folk knowledge, historic and contemporary visions, western and non-western perspectives, drawing on the social sciences and humanities. WR, SO

* **ER&M 3633a / HIST 3463a / SAST 3340a, Mobile South Asians and the Global Legal Order** Rohit De

South Asians make up the largest population of overseas migrants in the world, close to 33 million in 2017 and a diaspora that is almost double that number. This course looks at the unprecedented mobility of South Asians from the mid-19th century until now as merchants, indentured labor, students, pilgrims, professionals, domestic workers, political exiles, refugees, and economic migrants, through the lens of state attempts to control movement and individual resistance, subversion, and adaptation to such controls. Focusing on the legal consciousness of South Asian migrants and the emergence of South Asian nations as political players on the global stage, this class traces how South Asian mobility led to the forging of a new global order, over migration, multiculturalism, Islamic law, civil liberties, labor law, and international law. WR, HU

* **ER&M 3691b / AMST 4407b / HSHM 4550b, Eugenics and its Afterlives** Daniel HoSang

This course examines the influence of Eugenics research, logics, and ideas across nearly every academic discipline in the 20th century, and the particular masks, tropes, and

concepts that have been used to occlude attentions to these legacies today. Students make special use of the large collection of archives held within Yale Special Collections of key figures in the American Eugenics Society. Students work collaboratively to identify alternative research practices and approaches deployed in scholarly and creative works that make racial power visible and enable the production of knowledge unburdened by the legacies of Eugenics and racial science. HU o Course cr

* **ER&M 3695a / AMST 3365a / EP&E 4399a / FILM 2680, Platforms and Cultural Production** Julian Posada

Platforms—digital infrastructures that serve as intermediaries between end-users and complementors—have emerged in various cultural and economic settings, from social media (Instagram), and video streaming (YouTube), to digital labor (Uber), and e-commerce (Amazon). This seminar provides a multidisciplinary lens to study platforms as hybrids of firms and multi-sided markets with unique history, governance, and infrastructures. The thematic sessions of this course discuss how platforms have transformed cultural production and connectivity, labor, creativity, and democracy by focusing on comparative cases from the United States and abroad. The seminar provides a space for broader discussions on contemporary capitalism and cultural production around topics such as inequality, surveillance, decentralization, and ethics. Students are encouraged to bring examples and case studies from their personal experiences. HU, SO

* **ER&M 3831a / AMST 3831a / ENGL 3831a / WGSS 3831a, Texxture** Sunny Xiang

The term *texxture* was first used by queer studies scholars to describe a density of tactile information about an object's provenance, composition, circulation, and use. This brilliant coinage offers an immanent theorization of texture as something like an x-factor—an excess and an essence, something magical yet practical, a strange intensity and the thing itself. Such ambiguities, however, also contribute to texture's interpretive difficulties. For whether we have in mind a velvet armchair, a pair of distressed jeans, a handbound book, or a tablet computer, texture performs a dramatic revelation to the extent that it is also shadowed by deception and ambivalence. These paradoxes and cruxes inspire a range of inquiries for our class: What can the perception and creation of texture teach us about the sensorial and material politics of race, gender, empire, capitalism, and art? How might texture help us study the relation between desire and violence, especially at the interface of touch? What things, beings, events, places, emotions, and ideas appear to have a texture? What is texture's route to intelligibility, and is there a scale or unit at which texture vanishes? WR, HU

* **ER&M 4021a, Indigenous Women and the Law in the Anglophone Empire** Tarren Andrews

This seminar examines the historical and ongoing entanglement of Indigenous women and Anglophone legal systems, moving from early medieval England to the Pacific and North America. We begin with Old English legal codes that governed women's rights and social positions in early medieval English societies, questioning how these texts established gendered legal frameworks that later informed colonial legal structures. As we move geographically and temporally, we trace the ways British and American legal systems constructed Indigenous women as subjects of empire, shaping their legal status, kinship structures, and sovereignty. A central theme of the course is Indigenous women's resistance to settler legal impositions. Through case studies—including early colonial legal battles, the forced removals of women and children, and contemporary

struggles for justice and land rights—we examine how Indigenous women have asserted legal and extralegal agency in the face of colonial authority. WR, HU

* **ER&M 4050a / AMST 3339a, Bad Bunny: Musical Aesthetics and Politics** Albert Laguna
This course examines the music of Bad Bunny as a point of departure for developing our skills as close listeners attentive to how cultural production creates interpretive avenues for understanding how aesthetics, history, and politics intersect. Topics include the history of Puerto Rico and its colonial past and present (tourism, debt crisis, hurricanes); the evolution of musical forms (bomba, plena, salsa, reggaeton) and their travels across the Americas; and the Puerto Rican diaspora in New York City. none HU

* **ER&M 4067a / AFAM 4357a / AFST 4457a / AMST 4470 / FREN 481 / FREN 4810, Racial Republic: African Diasporic Literature and Culture in Postcolonial France** Fadila Habchi
This is an interdisciplinary seminar on French cultural history from the 1930s to the present. We focus on issues concerning race and gender in the context of colonialism, postcolonialism, and migration. The course investigates how the silencing of colonial history has been made possible culturally and ideologically, and how this silencing has in turn been central to the reorganizing of French culture and society from the period of decolonization to the present. We ask how racial regimes and spaces have been constructed in French colonial discourses and how these constructions have evolved in postcolonial France. We examine postcolonial African diasporic literary writings, films, and other cultural productions that have explored the complex relations between race, colonialism, historical silences, republican universalism, and color-blindness. Topics include the 1931 Colonial Exposition, Black Paris, decolonization, universalism, the Trente Glorieuses, the Paris massacre of 1961, anti-racist movements, the "beur" author, memory, the 2005 riots, and contemporary afro-feminist and decolonial movements. HU

ER&M 4091a, The Senior Colloquium: Theoretical and Methodological Issues Staff
A research seminar intended to move students toward the successful completion of their senior projects, combining discussions of methodological and theoretical issues with discussions of students' fields of research.

* **ER&M 4444a / RLST 2890a, Race, Religion, and Transnational Mobilities** Gana Ndiaye
This course surveys how "migrants" and "desirable migrants" are produced through race and religion in the Americas and Europe. It also examines how racial identities and religious beliefs inform human mobilities and shape the experiences of such mobile persons as settlers, exiles, asylum seekers, temporary workers, and economic migrants. By the end of the course, participants will familiarize themselves with the crucial roles that religious beliefs and practices play in causing and responding to human mobilities. Students will also gain familiarity with the ways in which migrants' religious practices transform local cultures, politics, and societies as their own religious practices are reconfigured by and in the context of host nations. Topics to be covered include citizenship and cultural difference, religion and the public sphere, multiculturalism, Islam and democracy, Christian Pentecostal missions, liberation theology, and African diasporic religions. SO

*** ER&M 4518b and ER&M 6606b / ANTH 4818b / SPAN 4618b / WGSS 4518b, Multi-Sited Ethnography: Trans-Atlantic Port Cities in Colombia and Spain** Eda Pepi and Ana Ramos-Zayas

Critical to colonial, imperial, and capitalist expansion, the Atlantic offers a dynamic setting for adapting ethnographic practices to address questions around interconnected oppressions, revolts, and revolutions that are foundational to global modernity. Anchored in a Spanish and a Colombian port city, this course engages trans-Atlantic 'worlding' through a multi-sited and historically grounded ethnographic lens. Las Palmas—the earliest mid-Atlantic port and Europe's first settler colony in Africa—and Cartagena—once the principal gateway connecting Spain and its American empire—illuminate urgent contemporary issues such as climate, displacement, inter-regional subjectivities, and commerce. During a spring recess field experience (March 8–16, 2026), students immerse themselves for four nights each in Las Palmas and Cartagena, developing critical "tracking" skills that bridge ethnographic practice with cultural theory. Preparation for fieldwork includes an on-campus curriculum, organized around Cartagena and Las Palmas, and sessions with Yale Ethnography Hub faculty, covering different methodologies. As part of this broader programming, the curriculum delves into trans-Atlantic migrations from the Middle East, South Asia, and Africa that have transformed port cities, labor and aesthetic practices, class-making racial formations, and global geopolitics. After recess, the course shifts toward independent work, as students synthesize field-collected data and insights into a collaborative multimodal group project and individual ethnographic papers. Interested students must apply by November 1st via the course website. Students may withdraw by the university deadlines in April. Prerequisite: Conversational and reading proficiency in Spanish. Readings are in English and Spanish, with assignments accepted in either language. HU

Film and Media Studies (FILM)

FILM 1501a, Introduction to Film Studies Staff

A survey of film studies concentrating on theory, analysis, and criticism. Students learn the critical and technical vocabulary of the subject and study important films in weekly screenings. Prerequisite for the major. WR, HU 0 Course cr

*** FILM 1610a / ART 2941a, Introductory Film Writing and Directing** Sahraa Karimi

Problems and aesthetics of film studied in practice as well as in theory. In addition to exploring movement, image, montage, point of view, and narrative structure, students photograph and edit their own short videotapes. Emphasis on the writing and production of short dramatic scenes. Priority to majors in Art and in Film & Media Studies. RP

*** FILM 1620a or b / ART 1942a or b, Introductory Documentary Filmmaking** Staff

The art and craft of documentary filmmaking. Basic technological and creative tools for capturing and editing moving images. The processes of research, planning, interviewing, writing, and gathering of visual elements to tell a compelling story with integrity and responsibility toward the subject. The creation of nonfiction narratives. Issues include creative discipline, ethical questions, space, the recreation of time, and how to represent "the truth." RP

*** FILM 1800a, Makeovers in Classical Hollywood Cinema** Staff
This course examines the American dream of the makeover in Hollywood cinema. We look at era-defining classical films from Hollywood's Golden Age to contemporary films and media to consider narratives of self-transformation. The course traces and interrogates conceptions of self and Other, person and thing that are summoned in cinematic visions of passing, self-improvement, restoration, and instant alteration. Some of the questions we ask are: What kind of labor does the makeover recognize and efface? What does it mean to make-over a self, a house, a genre, a people, a nation? How do we come to visualize such changes, and how do we know what it is we see? We watch films by Charlie Chaplin, Max Ophuls, Howard Hawks, Alfred Hitchcock, Douglas Sirk, Billy Wilder, Bob Fosse, Martin Scorsese, Janicza Bravo, among others. We read critics and theorists such as Barbara Johnson, André Bazin, Stanley Cavell, Lauren Berlant, Anne Anlin Cheng, Joan Copjec, and Roland Barthes to conceptualize the Hollywood makeover's connections to embodiment, sexuality, material objecthood, and racial difference. Along the way, we consider the visual lure and theoretical stakes of "making it." HU

FILM 1900a, Modes of Thinking Through Media Making Leighton Pierce
This foundational course is designed to generate conceptual and practical creative potentials within the processes of developing, making, and critiquing films and videos. Students explore principles of video creation through six layered projects, focusing on techniques and production processes rather than specific genres. This hands-on course emphasizes foundational videomaking skills, making it ideal for first- and second-year students or anyone interested in a non-commercial, conceptual approach to media making. HU RP

FILM 2167a / LAST 2165a / PORT 2165a / SPAN 2090a / WGSS 2165a, Through the Lens of Memory: Other Perspectives on Dictatorships in Latin America and Iberia Giseli Tordin
This course examines the cinematic portrayals of military dictatorships in Brazil, Argentina, Chile, Spain, and Portugal, exploring how film serves as both a historical document and a means to reinterpret and reconstruct the past. As a language course, it allows students to engage with multiple modes of meaning–linguistic, visual, auditory, tactile, gestural, and spatial–through which cinema conveys its narratives. Students analyze how films reconstruct memory, challenge hegemonic historiography, and reinscribe erased or silenced perspectives. The course reflects on the relevance of these works in contemporary struggles against violence and oppression, considering how they teach us to critically engage with power, resistance, and collective memory. It also focuses on women's cinematic productions and representations, examining how gender, race, and political resistance intersect in the visual representation of repression, violence, and memory. The course incorporates both Spanish and Portuguese, encouraging students to express their ideas and develop projects in either language. Languages: Portuguese and Spanish. Prerequisite: PORT 1400 (or equivalent) or SPAN 1400 (or equivalent). L5, HU

*** FILM 2540a / ENGL 2151a, Skin and Surface: Fashion and Culture** Staff
What do we mean by fashion? This course explores the intimate relationship between film, fashion, and various modes of self-fashioning and unfashioning. By examining the sartorial—what, or whom, we wear—in literature and film, we consider the ramifications of style in discourses on race and gender. We study films, novels, and

photography that focus on garments in ways that highlight the complex relationship among material histories, social fabrics, and notions of the corporeal and the human. Along the way, we unsettle the easy yet stubborn distinction between surface and interiority. From Alfred Hitchcock's Vertigo to Wendell B. Harris's Chameleon Street, Frederick Wiseman's documentary of department stores to Lee Bul's cyborg sculptures, this course asks: how does fashion constitute—or unravel—our notions of the self and of the world as "surface" activity? HU

* **FILM 2607a / CPLT 2607a, East/West European New Waves: Life and Revolution in the 1960s** Katie Trumpener

The 1960s were marked by a sense of profound political and aesthetic possibility: It is no coincidence that this period saw a transformation of what film could be as well. Often described as "New Waves," this new cinema responded to social change and intervened in it, attempting to understand and critique the social order even as it participated in popular culture and reworked film aesthetics. This course focuses on the new waves of European cinema, East and West. Within the broader trends of destalizination, decolonization, and the rise of youth and women's movements, we consider flashpoints including 1968 and the Vietnam War alongside the transformations in work, gender roles, and the qualities of everyday life—legacies that remain with us to this day (along with elements of 60s film style). Films from West and East Germany, the Soviet Union, Poland, Hungary, Czechoslovakia, Yugoslavia, Britain, France, Italy, Senegal, Cuba, and the United States, among others. Background in Film, European Languages, or European History is helpful, but not required. WR, HU

* **FILM 2800a / ENGL 3082a / PSYC 3320a, The Science and Culture of Memory** John Williams

This is an FAS-sponsored cross-divisional course. This course offers a comparative and interdisciplinary approach to the science and culture of memory. We aim to bring traditional philosophies, narratives, and histories of memory into conversation with both long established and cutting-edge research findings on the neuroscience of memory. Questions explored in the course include: What is memory and how does it work? How has memory been conceptualized over time in both culture and science? What are the various media through which we process memories, including collective and individual forms? What can we learn from moments of mnemonic failure? What new technologies of memory are on the horizon? How is our vision of the future influenced by the content and processes of memory? In wrestling with these questions, we encounter a wide selection of narratives, art objects, films, and scientific data. Students also have an opportunity to explore their own experiences in learning and memory (including experiential assignments, e.g., asking them to memorize certain things and report on the experience, as well as opportunities to reflect on their experiences of and access to forms of collective, communal memory). HU, SO

* **FILM 2827a / CPLT 3180a / GMAN 3180a / HUMS 3188a, Artificial Life: (Re)Production and the Limits of Humanity** Austen Hinkley

A mad scientist creates a living being in a laboratory; automata band together to overthrow their creators; a moving statue appears more lifelike than a human being. Such fantastical images and stories of artificial humanity haunt human culture, from ancient myths to contemporary media. This seminar explores such imaginations of the artificially human, with an emphasis on their role within German culture, in

order to examine the often-hazy boundary between artificial production and organic reproduction. We will discuss the significance of this boundary for our understanding of topics such as literature, art, labor, gender, and psychology. Readings are drawn from sources both ancient and modern, from discourses including religion, philosophy, alchemy, literature, and psychoanalysis. In addition to readings, film and other visual materials will be incorporated as primary texts. HU

* **FILM 2897a / GMAN 1701a / WGSS 1701a, Gender and Sexuality in German Literature and Film** Lea Jouannais

In this course, we will explore the 20th-century German artistic, literary, and cinematic canon through the lens of gender and sexuality. Queer and feminist perspectives will play a central role in our discussions, while also providing students with a broader understanding of artistic movements in the German-speaking world. A chronological approach, spanning from the interwar period to the present day, will serve as a guide through key moments in German history. Our readings and analyses will include works by Irmgard Keun and Mela Hartwig in the interwar period, August Sander's photographs, excerpts of Klaus Mann and Annemarie Schwarzenbach's texts, postwar literature with Ingeborg Bachmann, New German Cinema through the films of RW Fassbinder and Ulrike Ottinger; a novel by Elfriede Jelinek, the poetry of May Ayim, and contributions from contemporary German voices. This course is conducted entirely in German. It is recommended that students have completed one other L5 class, though exceptions are possible on a case-by-case basis. Please contact Language Program Director Theresa Schenker with questions: theresa.schenker@yale.edu L5, HU

FILM 2940a / ART 2943a, Cinematography: History, Theory, Practice Jonathan Andrews

This course serves to introduce students to the artistic practice of cinematography in the context of its history from the birth of cinema to the present. Readings, screenings, and discussions exploring film history are complemented by readings, workshops, and creative assignments exploring the tools, techniques, conventions, and scientific and psychological foundations of the cinematographer's art.

* **FILM 2980a / AMST 3303a / EP&E 247 / ER&M 3530a / SAST 2620a, Digital War** Madiha Tahir

From drones and autonomous robots to algorithmic warfare, virtual war gaming, and data mining, digital war has become a key pressing issue of our times and an emerging field of study. This course provides a critical overview of digital war, understood as the relationship between war and digital technologies. Modern warfare has been shaped by digital technologies, but the latter have also been conditioned through modern conflict: DARPA (the research arm of the US Department of Defense), for instance, has innovated aspects of everything from GPS, to stealth technology, personal computing, and the Internet. Shifting beyond a sole focus on technology and its makers, this class situates the historical antecedents and present of digital war within colonialism and imperialism. We will investigate the entanglements between technology, empire, and war, and examine how digital war—also sometimes understood as virtual or remote war—has both shaped the lives of the targeted and been conditioned by imperial ventures. We will consider visual media, fiction, art, and other works alongside scholarly texts to develop a multidiscpinary perspective on the past, present, and future of digital war. none HU, SO

* **FILM 3007a / RSEE 3120a / SLAV 3120a and SLAV 6120a / UKRN 3120a and UKRN 6120a, Cinematic Ukraine: Culture, Identity, and Memory** Olha Tytarenko

This course traces the evolution of Ukrainian cinema from the avant-garde experiments of the 1920s to the vibrant post-2014 film resurgence. Exploring themes of national identity, historical memory, and resistance to political and cultural oppression, we analyze how filmmakers have shaped Ukraine's self-conception through film. Topics include the poetic cinema of the 1960s, post-Soviet transition films, and contemporary works responding to war and cultural sovereignty. Students will engage critically with cinematic language, narrative structures, and visual aesthetics while incorporating perspectives from postcolonial theory and memory studies. The course features guest lectures from Ukrainian film directors and hands-on cinematographic workshops. Weekly thematic units pair films with historical and theoretical readings, offering a dynamic exploration of Ukraine's place in global cinema and cultural history. None HU

* **FILM 3057a / ITAL 4305a, Italian Film Ecologies: Yesterday, Today, and Tomorrow** Millicent Marcus

Landscape and the natural environment have never occupied "background" status in Italian film. Given the spectacular visual presence of its terrain—thanks to the relative proximity of mountain chains and the long seacoast—and given the pivotal importance of farming and pasturage in this traditionally agrarian economy, the synergy between the human and natural worlds has played a prominent role in Italian filmmaking since the very inception of the industry. Most recently, two developments have pushed this issue to the forefront of scholarly attention: the advent of ecocriticism, which found one of its earliest and most influential champions in Serenella Iovino, and the establishment of regional film commissions, grassroots production centers that sponsored cinematic works attuned to the specificity of "the local." The course includes study of films that predate our current environmental consciousness, as well as recent films that foreground it in narrative terms. In the case of the older films, which have already attracted a great deal of critical commentary over time, we work to shift our interpretive frame in an "eco-friendly" direction (even when the films' characters are hardly friends of the environment). Among the films considered are *Le quattro volte, Il vento fa il suo giro, L'uomo che verrà, Gomorra, L'albero degli zoccoli, Riso amaro, Red Desert*, *Christ Stopped at Eboli,* and *Il ladro di bambini*. We screen one film a week and devote our seminars to close analysis of the works in question. HU

* **FILM 3300a, The Screenwriter's Craft** Camille Thomasson

A rigorous writer's workshop. Students conjure, write, rewrite, and study films. Read screenplays, view movie clips, parse films, and develop characters and a scenario for a feature length screenplay. By the end of term, each student will have created a story outline and written a minimum of fifteen pages of an original script. All majors welcome. Application required. Please find the link to the application form on the syllabus.

* **FILM 3500a, Screenwriting** Shakti Bhagchandani

A beginning course in screenplay writing. Foundations of the craft introduced through the reading of professional scripts and the analysis of classic films. A series of classroom exercises culminates in intensive scene work. Prerequisite: FILM 150. Not open to first-year students.

* **FILM 3537a / AFST 3351a / CPLT 3351a / ENGL 2831a, The Nigerian 'Video Novel' and Nollywood** Staff

The course introduces students to an emerging genre of the Nigerian novel in which writers adopt narrative re-purposing strategies that invite transcription and adaptation to films. This evolving 'Nigerian visual novel', or 'video novel', is defined by its loosely structured, tabloid-themed and reader-friendly style, all reflecting the craft of Nollywood films, a thriving video film culture that emerged in the 1990s and has remained popular globally. Through the study of Nollywood films alongside new Nigerian fiction, the course will examine the techniques adopted by writers to accommodate the aesthetics of popular culture, to revive a declining readership, and to make literature more sellable. As these novels win literature prizes and find their way onto syllabi, the implications they have for our understanding of the African literary canon will be discussed. Students will view selected Nollywood movies and read a number of novels in the new genre in order to appraise the extent to which the serious and the sensuous intersect in this remaking of literariness. Seminar discussions will be accompanied by short lectures in which concepts such as 'trans-mediality', 'reverse-adaptation', 'screen-to-page', 'appropriation' and 'quotation' will be discussed to build an understanding of how the 'new' approach reconfigures Nigerian novels. HU

* **FILM 3540a / AMST 3334a / CPLT 3500a / GMAN 3460a / HUMS 3466a, Uwe Johnson's Anniversaries: From A Year in the Life of Gesine Cresspahl** Austen Hinkley

Uwe Johnson's *Anniversaries: From A Year in the Life of Gesine Cresspahl* remains a monument of postwar German literature—and it was written in and about New York City. Across its 367 short chapters (each corresponding to a day of the year), the novel unfolds on three levels: the historical present in New York, memories and family history from Germany, and reporting from the New York Times on current events. The result is a view of life, politics, and history in the middle of the 20th century that is as rich and expansive as it is fragmented. The social and political climate of New York in the late '60s is put into contact with memories of the rise of Nazism in Germany; reporting on the Vietnam war, the civil rights movement and the Prague Spring is refracted through the lenses of the protagonist's past life in East Germany and her new life raising her daughter alone in New York. This course undertakes a close reading of Johnson's sprawling novel with attention to its many historical, political, and literary contexts. Readings from the novel are complemented by relevant short readings on theories of media, politics, literature, and history. No prior knowledge of German language and literature is required.
HU

FILM 3550b / ART 3941b, Intermediate Film Writing and Directing Jonathan Andrews

In the first half of the term, students write three-scene short films and learn the tools and techniques of staging, lighting, and capturing and editing the dramatic scene. In the second half of the term, students work collaboratively to produce their films. Focus on using the tools of cinema to tell meaningful dramatic stories. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 2941. RP

FILM 3560b / ART 3942b, Intermediate Documentary Filmmaking A.L. Steiner

Students explore the storytelling potential of the film medium by making documentaries an art form. The class concentrates on finding and capturing intriguing,

complex scenarios in the world and then adapting them to the film form. Questions of truth, objectivity, style, and the filmmaker's ethics are considered by using examples of students' work. Exercises in storytelling principles and screenings of a vast array of films mostly made by independent filmmakers from now to the beginning of the last century. Limited enrollment. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 1942 or 2941 HU RP

* **FILM 3740b / HUMS 3475b, Media and Protection** Francesco Casetti
Alarm systems safeguard private homes; passwords filter access to websites; digital watches monitor vital signs; x-rays scan passengers in airport terminals; locked doors requiring IDs isolate sensitive sites; GPS helps escape traffic jams; weather forecasts warn how to avoid impending disasters; whistleblowing platforms stop wrongdoing; online entertainment offers respite from external pressures; and social networks allow online exchanges between individuals who want to bypass physical interactions. A full range of media provide protection against what appears to be a threatening milieu. However, protection has a cost in terms of values and habits. It requires identifying and even materializing a threat and an enemy; it implies a step back from the direct experience of reality and others; and ultimately it idealizes a safe world. But is the world ready to be safe? Is the enemy a necessary invention? Is security guaranteed to all? And ultimately, is protection the only remedy for our fears? This seminar addresses such questions. HU

* **FILM 3990a / ENGL 2411a, The Craft of Graphic Narrative** Alison Bechdel
This class explores the ways that text and sequential images work together to tell stories. This class will be a roughly equal mix of theory and practice, of reading comics with a critical eye and making your own comics. We'll study aspects of craft like voice, structure, point of view, description, and character development, as well as comics-specific elements such as page layout, panel transitions, and the abstract-to-realistic drawing style continuum. This is a beginner-level class. You don't need to be an experienced cartoonist, but an affinity for drawing will serve you well. RP

* **FILM 4140a / AFAM 3314, Jazz and African-American Historical Representations in American Films** Claire Demoulin
This course deals with the presence of jazz music in American cinema, mainly in Hollywood films. Beyond considering the role of major jazzmen and jazzwomen in films such as Duke Ellington, Cab Calloway, Louis Armstrong, Billie Holiday, Charles Mingus, Benny Goodman, Thelonious Monks, Lena Horne, etc., we also analyze how jazz and African Americans are represented in Hollywood films featuring this music as a focal point or as musical accompaniment. Jazz music has served historically as a medium for early African-American presence in Hollywood films, via musical numbers and performances (Duke Ellington orchestra, the Nicholas Brothers, etc.), all while conforming to the demands of major film companies. During WWII, wartime films saw in jazz the opportunity to convey consent and support for the war (*Birth of the Blues, Blues in the Night, Syncopation*). By exploring films from the 1930s to the 1970s, and cross-examining essays by Paul Gilroy, Krin Gabbard, and others, this course calls into question these attempts and investigates the early silencing, instrumentalization, and reappropriation processes commonly characteristics of Hollywood. We contextualize this filmography by comparing it with films made by African-American film directors and analyzing their use of jazz music. The course illustrates how jazz music embodies a formal and political counter-power, evident

through its themes and compositions, and demonstrates how films such as *The Cry of Jazz*, or *The Connection* capture this spirit. HU

* **FILM 4200a / MUSI 4478a, Radio** Brian Kane
Introduction to selected topics in the social history, technique, and meaning of radio in America, with a focus on music and mediation. Topics may include: the nature of the "radio archive;" early radio listening (DXing); the formation of the networks; advertising; the rise of audience research; African-American radio; the origins of the DJ and format radio. Workload may include: short papers, book reviews, radio building, archival research, and end-of- semester project. HU

* **FILM 4220a / ENGL 2145a / HUMS 4145a, The Aesthetics of Adaptation** Katja Lindskog
Adaptations of literary texts are the bread and butter of visual narrative media like TV and film. Adaptations of certain authors and texts have given rise to entire sub-genres and cottage industries. We consider what adaptations of literary texts, particularly very famous and beloved texts, might help us understand better about the texts themselves, and about the needs and expectations of the audiences of their adaptations. To that purpose, this course explores the purposes and effects of adaptation through a study of a variety of screen versions of adapted texts by authors including Jane Austen, Emily St. John Mandel, and Geoffrey Chaucer. Assigned readings include both literary texts and screen adaptations. HU

* **FILM 4270a / HUMS 2631a / MUSI 4470a, Noise** Brian Kane
A study of noise from musical, philosophical, and cultural perspectives. Reading and discussion of theoretical, political, ecological, and avant-garde writings on noise; critical study of musical repertoire involving noise, sound art, and recorded sound; introduction to current debates in sound studies and auditory culture; hands-on work with electronic noise. WR, HU

* **FILM 4470a / AMST 4449a / HIST 2114a, The Historical Documentary** Charles Musser
This course looks at the historical documentary as a method for carrying out historical work in the public humanities. It investigates the evolving discourse sand resonances within such topics as the Vietnam War, the Holocaust and African American history. It is concerned with their relationship of documentary to traditional scholarly written histories as well as the history of the genre and what is often called the "archival turn."

* **FILM 4550a / AMST 4463a / EVST 4630a / TDPS 4023a, Documentary Film Workshop** Charles Musser
A yearlong workshop designed primarily for majors in Film and Media Studies or American Studies who are making documentaries as senior projects. Seniors in other majors admitted as space permits. RP

* **FILM 4670a / ENGL 4411a, Making Comics** Alison Bechdel
This advanced class will explore the alchemy of combining words and pictures into the visual language of comics. We'll touch on some history and theory of comics, but this is a hands-on writing/drawing class, and the focus will be on practice: how to write, draw, design, and produce your own work. We'll be looking at different formats like single panel comics, strips, and minicomics, as well as full-length graphic novels, memoirs, and journalism. You'll keep a sketchbook and develop a daily drawing

practice. For most of the second half of the semester, you'll be working on your own minicomic. Some cartooning experience or drawing ability will be helpful.

* **FILM 4680a / CPLT 3940a / GMAN 4050a, Weimar Cinema** Fatima Naqvi and Claire Demoulin
The German cinema, 1919–1930. Expressionist films and films of the New Objectivity. The pressures of technology and the other arts on cinema; issues of spectatorship, visual pleasure, and distraction. Readings by Simmel, Kracauer, Benjamin, and others. Films by Murnau, Lang, Lubitsch, Pabst, Brecht, von Sternberg, and others. Unless otherwise indicated, courses in this group are conducted in English with both readings and discussion in English. The courses are open to all students in Yale College. Conducted in English, with readings in English. HU

* **FILM 4710a, Independent Directed Study** Shakti Bhagchandani
For students who wish to explore an aspect of film and media studies not covered by existing courses. The course may be used for research or directed readings and should include one lengthy essay or several short ones as well as regular meetings with the adviser. To apply, students should present a prospectus, a bibliography for the work proposed, and a letter of support from the adviser to the director of undergraduate studies. Term credit for independent research or reading may be granted and applied to any of the requisite areas upon application and approval by the director of undergraduate studies.

* **FILM 4800a, Film and Media Hybridity Lab** Leighton Pierce
This course supports senior majors completing a screenwriting or moving image/sound project as their thesis. The focus is to support innovative, hybrid, and emergent forms of film/media making and writing, or to support conventional projects through custom-designed practical exercises. There are two options: 1) the lab as a context for innovative film/media/writing projects that do not productively fit into the standard FMS senior courses, or 2) the lab as a supplement to the standard FMS thesis production classes. In this case, the thesis project would be overseen in the standard thesis classes with the lab serving as conceptual and practical development through specifically designed exercises in technique, critique, and conceptual exploration. For Film and Media Studies seniors only. Permission of the instructor and DUS required. RP

* **FILM 4830a and FILM 4840b / ART 4942a and ART 4943b, Advanced Film Writing and Directing** Jonathan Andrews
A yearlong workshop designed primarily for majors in Art and in Film & Media Studies making senior projects. Each student writes and directs a short fiction film. The first term focuses on the screenplay, production schedule, storyboards, casting, budget, and locations. In the second term students rehearse, shoot, edit, and screen the film. Priority to majors in Art and in Film & Media Studies. Prerequisite: ART 3941.

* **FILM 4870a, Advanced Screenwriting** Shakti Bhagchandani
Students write a feature-length screenplay. Emphasis on multiple drafts and revision. Admission in the fall term based on acceptance of a complete step-sheet outline for the story to be written during the coming year. Primarily for Film & Media Studies majors working on senior projects. Prerequisite: FILM 395 or permission of instructor.

*** FILM 4910a, The Senior Essay** John Peters
An independent writing and research project. A prospectus signed by the student's adviser must be submitted to the director of undergraduate studies by the end of the second week of the term in which the essay project is to commence. A rough draft must be submitted to the adviser and the director of undergraduate studies approximately one month before the final draft is due. Essays are normally thirty-five pages long (one term) or fifty pages (two terms).

*** FILM 4930a, The Senior Project** John Peters
For students making a film or video, either fiction or nonfiction, as their senior project. Senior projects require the approval of the Film and Media Studies Committee and are based on proposals submitted at the end of the junior year. An interim project review takes place at the end of the fall term, and permission to complete the senior project can be withdrawn if satisfactory progress has not been made. For guidelines, consult the director of undergraduate studies. Does not count toward the fourteen courses required for the major when taken in conjunction with FILM 455, 456 or FILM 483, 484.

Finnish (FNSH)

FNSH 1300a, Intermediate Finnish I Staff
The structure of the Finnish Studies Program at Columbia University ensures that students receive a solid grounding in both the language and the culture of Finland. The Program promotes the development of language ability through students' participation in communicative activities and discussions. This course provides students a thorough and consistently structured revision of intermediate linguistic competence in Finnish including listening, speaking, reading, and writing. Students learn to talk fluently about a wide range of topics from everyday life, speak about recent past, read and understand newspaper articles, and use appropriate grammatical structures. Prerequisite: FNSH 120 or equivalent. L3 RP 1½ Course cr

FNSH 1400b, Intermediate Finnish II Staff
The structure of the Finnish Studies Program at Columbia University ensures that students receive a solid grounding in both the language and the culture of Finland. The Program promotes the development of language ability through students' participation in communicative activities and discussions. This course is designed to further develop language skills at the intermediate level and provides a continuation of Finnish L3 along with study of the culture and cultural practices of the Finnish-speaking society. Prerequisite: FNSH 130 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L4 RP 1½ Course cr

French (FREN)

*** FREN 1100a, Elementary and Intermediate French I** Staff
Intensive training and practice in all the language skills, with an initial emphasis on listening and speaking. Emphasis on communicative proficiency, self-expression, and cultural insights. Extensive use of audio and video material. Conducted entirely in French. To be followed by FREN 120. For students with no previous experience of French. Daily classroom attendance is required. L1 1½ Course cr

* **FREN 1200b, Elementary and Intermediate French II** Staff
Continuation of FREN 110. Open only to students who took FREN 110 (L1) at Yale. Conducted entirely in French. Only after FREN 110. To be followed by FREN 130. L2 1½ Course cr

* **FREN 1210a, Intermediate French** Candace Skorupa
Designed for initiated beginners, this course develops all the language skills with an emphasis on listening and speaking. Activities include role playing, self-expression, and discussion of cultural and literary texts. Emphasis on grammar review and acquisition of vocabulary. Frequent audio and video exercises. Conducted entirely in French. Daily classroom attendance is required. Placement according to placement test score. Online preregistration required; see french.yale.edu for details. L2 1½ Course cr

* **FREN 1250a, Intensive Elementary French** Constance Sherak
An accelerated course that covers in one term the material taught in FREN 110 and 120. Practice in all language skills, with emphasis on communicative proficiency. Admits to FREN 145. Conducted entirely in French. For students of superior linguistic ability. No preregistration required. L1, L2 RP 2 Course cr

* **FREN 1300a or b, Intermediate and Advanced French I** Staff
The first half of a two-term sequence designed to develop students' proficiency in the four language skill areas. Prepares students for further work in literary, language, and cultural studies, as well as for nonacademic use of French. Oral communication skills, writing practice, vocabulary expansion, and a comprehensive review of fundamental grammatical structures are integrated with the study of short stories, novels, and films. Admits to FREN 140. Conducted entirely in French. After FREN 120, 121, or a satisfactory placement test score. L3 RP 1½ Course cr

* **FREN 1400a or b, Intermediate and Advanced French II** Staff
The second half of a two-term sequence designed to develop students' proficiency in the four language skill areas. Introduction of more complex grammatical structures. Films and other authentic media accompany literary readings from throughout the francophone world, culminating with the reading of a longer novel and in-class presentation of student research projects. Admits to FREN 150. Conducted entirely in French. After FREN 130 or a satisfactory placement test score. L4 RP 1½ Course cr

* **FREN 1450b, Intensive Intermediate and Advanced French** Candace Skorupa
An accelerated course that covers in one term the material taught in FREN 130 and 140. Emphasis on speaking, writing, and the conversion of grammatical knowledge into reading competence. Admits to FREN 150. For students of superior linguistic ability. Conducted entirely in French. After FREN 120, 121, or 125. No preregistration required. L3, L4 2 Course cr

* **FREN 1500a or b, Advanced Language Practice** Staff
An advanced language course intended to improve students' comprehension of spoken and written French as well as their speaking and writing skills. Modern fiction and nonfiction texts familiarize students with idiomatic French. Special attention to grammar review and vocabulary acquisition. Conducted entirely in French. After FREN 1400, 1450, or a satisfactory placement test score. L5

* **FREN 1600a or b, Advanced Conversation Through Culture, Film, and Media** Staff
Intensive oral practice designed to further skills in listening comprehension, speaking, and reading through the use of videos, films, fiction, and articles. Emphasis on

contemporary French and francophone cultures. Conducted entirely in French. Prerequisites: FREN 150, 151, or a satisfactory placement test score, or with permission of the course director. May be taken concurrently with or after FREN 170. L5

* **FREN 1700a or b, Introduction to Literatures in French** Staff
Introduction to close reading and analysis of literary texts written in French. Works by authors such as Marie de France, Molière, Balzac, Hugo, Baudelaire, Duras, Proust, and Genet. Please note the syllabus is different for each section. Each syllabus can be found on the syllabus tab of the section course resources in Yale Course Search. May not be taken after FREN 171. L5, HU

* **FREN 1820b, Advanced Writing Workshop** Ramla Bedoui
An advanced writing course for students who wish to work intensively on perfecting their written French. Frequent compositions of varying lengths, including creative writing, *rédactions* (compositions on concrete topics), and *dissertations* (critical essays). Recommended for prospective majors. Conducted entirely in French. After FREN 150 or higher, or a satisfactory placement test score. May be taken after courses in the 200–449 range. L5

* **FREN 1830a, Medical French: Conversation and Culture** Leo Tertrain
An advanced language course emphasizing verbal communication and culture. Designed to introduce students to historical and contemporary specificities of various Francophone medical environments, and to foster the acquisition of vocabulary related to these environments. Discussions, papers, and oral presentations, with a focus on ethical, economic, legal, political, semiological, and artistic questions. Topics such as public health policies, epidemics, medicine in Francophone Africa, humanitarian NGOs, assisted reproductive technologies, end-of-life care, and organ donation are explored through films, documentaries, graphic novels, a literary text, an autobiographical narrative, and articles. Conducted entirely in French. Prerequisite: FREN 150 or a satisfactory placement test score, or with permission of instructor. L5

* **FREN 1840b, Business French: Communication and Culture** Leo Tertrain
An advanced language course emphasizing verbal communication and culture. Designed to introduce students to historical and contemporary specificities of various Francophone economic environments, and to foster the acquisition of vocabulary related to these environments. Discussions, papers, and oral presentations, with a focus on ethical, political, legal, semiological, and artistic questions. Topics such as taxation, privatization, the eurozone, the energy industry, labor unions, labor law, banking, the sharing economy, and human resources are explored through films, documentaries, a graphic novel, a literary text, a biographical narrative, articles, and excerpts from essays. Conducted entirely in French. Prerequisite: FREN 150 or a satisfactory placement test score, or with permission of instructor. L5

* **FREN 2330a, Contemporary French Literature in the Making** Morgane Cadieu
A survey of landmark contemporary novels coupled with a workshop. On the one hand, we read important twenty-first-century novels and narratives, discuss literary movements, genres, and trends, and explore contemporary literary life (media, prizes, publishing houses, literary quarrels). On the other hand, students are in charge of selecting and giving a presentation on a novel of their choice from the fall 2025 list of new releases. This way, we practice and compare different types of literary criticism, so as to acquire the tools to examine contemporary literature in the making. Seminar

taught in French open to graduate students and to undergraduate students who completed at least one course in French in the 2000–4000 range HU

* **FREN 3001b, Home Alone in Contemporary French Literature** Morgane Cadieu
How do we inhabit space alone? How do writers portray home-loving protagonists?In this seminar, we read twenty-first-century fictions of confinement that represent various forms of isolation, whether temporary or permanent, constrained or self-imposed, gloomy or gleeful, indoors or outdoors. Novels depict housesitting, house moves, retreats in cabins, suburban hoardings, lockdowns in boats and spaceships, or even the experience of finding yourself accidentally trapped in a workplace restroom over the weekend. We examine our relationship to spaces, objects, bodies, and technologies, as well as the forms of attention generated by seclusion, from daydreaming to tracking. This is not a course on Covid quarantine, although our discussions will resonate with the memory of stay-at-home orders. The seminar doubles as an introduction to contemporary literature. Students learn how to acquire information on authors and novels in the absence of canonical criticism. The corpus includes some books written by established authors and many books from younger, lesser-known, but noteworthy voices. Taught in French. HU

* **FREN 3012b, Literary Translation: Contemporary Workshop** Nichole Gleisner
This course will focus on translating contemporary literature by exploring concerns of writers and translators working in the French and Francophone field today. Each week, students will translate an excerpt from a wide variety of texts written in French: prose, poetry, graphic novels, YA, science fiction, long-form journalism. We will also read and craft literary criticism, paying special attention to reviews of books in translation as we seek to understand and define the role of the translator in our current day. How does literary criticism complement the work of translation? In what ways is the current mode of approaching translations in reviews lacking? How can we develop criteria to evaluate works in translation that acknowledge the role of the translator ? How do these activities—both translating and reviewing—enrich scholarly communities, webs of thought, networks of writers, students' own ways of approaching and understanding a text? Students will translate and workshop selections each week as well as undertake the translation of a significant portion (25-35 pages) of a contemporary text of their own. L5 level required. HU

* **FREN 3090b, Fictions of Consumer Society** Morgane Cadieu
The seminar examines literary and cinematic versions of the consumer society—from the late nineteenth to the twenty-first century—by discussing: the aesthetics of everyday life; the representation of stores, supermarkets, and malls in rural and urban settings; consumerism and colonization; mythologies, commodities, and gender norms; labor and waste; and the attention to objects (still life, window displays). Works by Danticat, Ernaux, Houellebecq, NDiaye, Perec, Reza, and Zola. Films by Demy, Godard, Tati, and Varda. Short theoretical excerpts by Baudrillard, Barthes, and Moudileno. No knowledge of French required. WR, HU

* **FREN 3200a, The Existentialist Cafe** Alice Kaplan
The Existentialist Café examines a moment (post-war France), a condition (liberation from Nazi occupation), a school of thought (existentialism) and a group of writers in conversation with one another (Sartre, Beauvoir, Camus, Baldwin, Sagan, Fanon). Sarah Bakewell's *In the Existentialist Café* provides a foundation for our exploration of existentialism as a movement. We read novels, plays, diaries, and essays from the

postwar era in France, considering existentialism both as a form of critical engagement and a specific intellectual and cultural situation. This is a group B course and is conducted entirely in French. Students must have above FREN 1700-level language skills. HU

* **FREN 3210b, Corneille and Racine: Passions and Politics on the French Classical Stage** Pierre Saint-Amand

This course consists of close readings of the major political tragedies of the classical period, from the famous dueling playwrights, Pierre Corneille and Jean Racine. We consider how the language of passions intersects with the language of politics, the dialectics of desire and violence, of Hero and State. Study of the recurring major passions: love, jealousy, hate, and how they are dealt with, sometimes repaired. We extend our study to the religious plays by the respective authors. Ability to read, write, and speak French. L5, HU

* **FREN 3675a / AFAM 3675a / AMST 3355a / ER&M 3574a / LAST 2675a, Haiti Writes I** Marlene Daut and Kaiama Glover

From nineteenth-century antislavery pamphleteering to accounts of ecological catastrophe in 21st-century fiction, Haitian literature has resounded across the globe since the nation's revolutionaries declared independence in 1804. Starting with pre-revolutionary writing, including the emergence of Haitian Creole letters, moving through a long, largely francophone nineteenth century, to present-day Haitian writing in the English language, this two-semester exploration of Haitian literature presents the political, cultural, and historical frameworks necessary to comprehend Haiti's vast literary output. Whether writing in Haiti or its wide-ranging diasporas, Haitian authors have boldly contributed to pressing conversations in global letters while reflecting Haiti's unique cultural and historical experiences. Considering an expansive array of poets, playwrights, and novelists - such as Baron de Vastey, Juste Chanlatte, Demesvar Delorme, Edwidge Danticat, René Depestre, Kettly Mars, Dany Laferrière, and Évelyne Trouillot—this course engages students in a fresh examination of Haiti's richly polyglot and transnational literary tradition that spans more than two centuries.

* **FREN 3680b, Reasoning with Voltaire** Pierre Saint-Amand

An investigation of the French Enlightenment through its principal representative philosopher, Voltaire. An examination of Voltaire's preoccupations, including philosophy, religion, tolerance, freedom, and human rights. Readings include Voltaire's *contes*, major plays, entries from the *Dictionnaire philosophique*, treatises, and pamphlets. Conducted entirely in French. L5

* **FREN 4160a / ER&M 3535a / WGSS 4416a, Social Mobility and Migration** Morgane Cadieu

The seminar examines the representation of upward mobility, social demotion, and interclass encounters in contemporary French literature and cinema, with an emphasis on the interaction between social class and literary style. Topics include emancipation and determinism; inequality, precarity, and class struggle; social mobility and migration; the intersectionality of class, race, gender, and sexuality; labor and the workplace; homecomings; mixed couples; and adoption. Works by Nobel Prize winner Annie Ernaux and her peers (Éribon, Gay, Harchi, Linhart, Louis, NDiaye, Taïa). Films by Cantet, Chou, and Diop. Theoretical excerpts by Berlant, Bourdieu, and Rancière.

Students will have the option to put the French corpus in dialogue with the literature of other countries. Conducted in French. HU

* **FREN 4180b, The Old French Fable and Fabliaux** R Howard Bloch
This seminar is designed to acquaint the student with the *Fables* of Marie de France and a substantial portion of the 170 fabliaux. We also consider the relevant secondary literature, the historical, cultural, social, religious, and critical background of the animal and the verse comic tales, which lie at the root core of didactic and of humorous and realistic literature in English, Italian, German, and Spanish. Both the *Fables* and the fabliaux are to be read in English, in the translations of Harriet Spiegel and Nathaniel Dubin. Both books, available at the World Language Center, contain the Old French originals and the translated texts. WR, HU

* **FREN 4700a, Special Tutorial for Juniors and Seniors** Thomas Connolly
Special projects set up by the student in an area of individual interest with the help of a faculty adviser and the director of undergraduate studies. Intended to enable the student to cover material not offered by the department. The project must terminate with at least a term paper or its equivalent and must have the approval of the director of undergraduate studies. Only one term may be offered toward the major, but two terms may be offered toward the bachelor's degree. For additional information, consult the director of undergraduate studies.

* **FREN 4910a, The Senior Essay** Thomas Connolly
A one-term research project completed under the direction of a ladder faculty member in the Department of French and resulting in a substantial paper in French or English. For additional information, consult the director of undergraduate studies.

FREN 4920a, The Senior Essay—Translation Concentration Thomas Connolly
A one-term research project completed under the direction of a ladder faculty member in the Department of French and resulting in a substantial translation (roughly 30 pages) from French to English, with a critical introduction of a length to be determined by the student in consultation with the advising ladder faculty member. Materials submitted for the translation concentration cannot be the same as the materials submitted for the translation courses. For additional information, consult the director of undergraduate studies.

* **FREN 4930a / FREN 4950a, The Senior Essay in the Intensive Major** Thomas Connolly
A yearlong research project completed under the direction of a ladder faculty member in the Department of French and resulting in a paper of considerable length, in French or English. For additional information, consult the director of undergraduate studies.

FREN 4950a / FREN 4930a, The Senior Essay in the Intensive Major—Translation Concentration Thomas Connolly
First term of a yearlong research project completed under the direction of a ladder faculty member in the Department of French and resulting in a translation of considerable length (roughly 60 pages), from French to English, with a critical introduction of a length to be determined by the student in consultation with the advising ladder faculty member. Materials submitted for the translation concentration cannot be the same as the materials submitted for the translation courses. For additional information, consult the director of undergraduate studies.

* **FREN 4980a, Fin-de-siècle France** Maurice Samuels
The last decades of the nineteenth century were a time of both social turmoil and artistic exuberance in France. This course examines major literary and artistic movements (Naturalism, Decadence, Symbolism, etc.) in their cultural context. Why was this productive period obsessed with its own doom? Literary texts are paired with recent critical theory as well as nineteenth-century discourses on such topics as sociology, criminology, sexology, and technology. Some attention is paid to the visual arts and to *fin-de-siècles* in other times and places (particularly Austria, Germany, and England). Students should have advanced (L5) reading knowledge of French. HU

German Studies (GMAN)

* **GMAN 0400a / HUMS 0410a, The Top Ten: Best Books of the 21st Century** Sophie Schweiger
In 2025, *The New York Times* published a list of "The Best 100 Books of the 21st Century." We will not read all of them. Instead, we will ask what it means to rank literature in the first place, as our class takes a closer look at some the different measures by which books can be made subject to a ranking—for example: sales numbers, expert opinion, and critical acclaim, or success through translation and adaptation. We study the different ways of awarding book prizes and curating lists of literature. Additionally, we study the circumstances that lead to literary "hypes," including Netflix adaptations, BookTok, and the author-as-celebrity. We read novels and excerpts of novels by some of the *New York Times'* top-ranked authors, as well as by Nobel Prize laureates of recent years, and compare the different modes of selection and the benefits as well as biases inherent to the respective lists. We also look at currently circulating lists of "banned books" and the works of literature banned from official reading lists and syllabi to understand another aspect of the politics behind the curation of lists. We close our literary journey with a text by author Toni Morrison who, curiously, made all three lists. Enrollment limited to first-year students. HU

* **GMAN 1000b, German for Reading** Stefan Lessmann
Students learn the skills with which to read German-language texts of any difficulty with some fluency. Study of syntax and grammar; practice in close reading and translation of fiction and expository prose in the humanities and sciences. Conducted in English. Does not satisfy the language distributional requirement.

* **GMAN 1100a or b, Elementary German I** Staff
A beginning content- and task-based course that focuses on the acquisition of spoken and written communication skills, as well as on the development of cultural awareness and of foundations in grammar and vocabulary. Topics such as school, family life, and housing. Course materials include a variety of authentic readings, a feature film, and shorter video clips. Tutors are available for extra help. To be followed by GMAN 120. Enrollment limited to 14 per section. L1 1½ Course cr

GMAN 1200a or b, Elementary German II Staff
Continuation of GMAN 110. A content- and task-based course that focuses on the acquisition of communicative competence in speaking and writing and on the development of strong cultural awareness. Topics such as multiculturalism, food, childhood, and travel; units on Switzerland and Austria. Course materials include a variety of authentic readings, a feature film, and shorter video clips. Tutors are available

for extra help. To be followed by GMAN 130. Enrollment limited to 14 per section. L2 1½ Course cr

GMAN 1300a or b, Intermediate German I Staff
Builds on and expands knowledge acquired in GMAN 120. A content- and task-based course that helps students improve their oral and written linguistic skills and their cultural awareness through a variety of materials related to German literature, culture, history, and politics. Course materials include authentic readings, a feature film, and shorter video clips. Tutors are available for extra help. After GMAN 120 or according to placement examination. Followed by GMAN 140. Enrollment limited to 14 per section. L3 1½ Course cr

GMAN 1400a or b, Intermediate German II Staff
Builds on and expands knowledge acquired in GMAN 130. A content- and task-based course that helps students improve their oral and written linguistic skills and their cultural awareness through a variety of materials related to German literature, culture, history, and politics. Course materials include authentic readings, a feature film, and shorter video clips. Tutors are available for extra help. After GMAN 130 or according to placement examination. Normally followed by GMAN 150 or, with permission of the director of undergraduate studies, by GMAN 171. Enrollment limited to 14 per section. L4 1½ Course cr

* **GMAN 1630b, The Afro-German Experience** Theresa Schenker
Investigation of the history and culture of Afro-Germans. Topics include pre-colonial contacts between Africans and Germans, German colonies in Africa, and the Afro-German fate during and after the Nazi regime. Strong focus on the experience of Afro-Germans in contemporary Germany as seen in Afro-German fictional and non-fictional texts and media. Course culminates in an analysis of the image of people of color and questions of racism in Germany today Prerequisites: German 150, another advanced German class, or with permission of instructor. L5, HU

* **GMAN 1650a, The German Fairy Tale and its Legacy** Theresa Schenker
Once upon a time, long before Tolkien, Disney, or Rowling, two brothers named Grimm published a collection of fairy tales that went on to have an immense cultural impact throughout the world. German children grow up with these fairy tales and they play a huge part in German culture even today. The Grimm fairy tales are the textual point of departure for a multi-faceted, integrative exploration of this popular and influential genre through time. Students explore fairy tales by Wilhelm Hauff and Ludwig Bechstein, as well as traditional cultural theories of the German fairy tale, psychoanalytic and pedagogical interpretive approaches, and contextualization of this genre in cultural and social history. The focus is on the role that the literary fairy tale played in German culture throughout history and the impact German fairy tales still have today. Prerequisite: Successful completion of L4 German, or appropriate level on the German placement test. L5, HU

* **GMAN 1690a, Architecture, Art and Social Justice** Marion Gehlker
This class introduces students to aspects of architecture as art and building design, within the context of social and environmental justice issues in the 20th and 21st centuries. Students explore the "New Settlements of Berlin Modernism," the Bauhaus School, subsidized public housing, industrial and solar architecture in Germany, as well

as examples at Yale and in New Haven. Prerequisite: GMAN 140 or equivalent, any L5 class, permission of the instructor. L5, HU

*** GMAN 1701a / FILM 2897a / WGSS 1701a, Gender and Sexuality in German Literature and Film** Lea Jouannais

In this course, we will explore the 20th-century German artistic, literary, and cinematic canon through the lens of gender and sexuality. Queer and feminist perspectives will play a central role in our discussions, while also providing students with a broader understanding of artistic movements in the German-speaking world. A chronological approach, spanning from the interwar period to the present day, will serve as a guide through key moments in German history. Our readings and analyses will include works by Irmgard Keun and Mela Hartwig in the interwar period, August Sander's photographs, excerpts of Klaus Mann and Annemarie Schwarzenbach's texts, postwar literature with Ingeborg Bachmann, New German Cinema through the films of RW Fassbinder and Ulrike Ottinger; a novel by Elfriede Jelinek, the poetry of May Ayim, and contributions from contemporary German voices. This course is conducted entirely in German. It is recommended that students have completed one other L5 class, though exceptions are possible on a case-by-case basis. Please contact Language Program Director Theresa Schenker with questions: theresa.schenker@yale.edu L5, HU

GMAN 2080a / HIST 12554a, Germany from Unification to Refugee Crisis Staff

The history of Germany from its unification in 1871 through the present. Topics include German nationalism and national unification; the culture and politics of the Weimar Republic; National Socialism and the Holocaust; the division of Germany and the Cold War; the Student Movement and New Social Movements; reunification; and Germany's place in contemporary Europe. HU 0 Course cr

*** GMAN 3030a / PHIL 3323a, The Frankfurt School** Jacob McNulty

The Frankfurt School of Critical Theory was (is) a group of eclectic interdisciplinary Marxist philosophers and social scientists, active from the 1920s to the present. Most were German Jews born around the turn of the 20th century. The Frankfurt school were a group of thinkers in almost perpetual exile. Simultaneously critical of American capitalism and of Soviet Communism, they were expelled from their native Germany in the wake of Hitler's rise to power. They also often lacked any intellectual safe haven, finding themselves at odds much philosophical and social-scientific orthodoxy (positivism, neo-Kantianism, "value-free" social science etc.). The critical theorists of the Frankfurt School sought to re-actualize ideas from the philosophical tradition, especially from Kant and Hegel, in order to address the complex realities of modern society: mass culture; fascism, totalitarianism and authoritarianism; world war; imperialism; secularization; irrationality, sexuality and aggression; and so on. This class looks at critical theory from a philosophical perspective, focusing on its claim to fuse traditional philosophy and radical social science. At least one prior course in philosophy, preferably in Kant or political philosophy. HU

*** GMAN 3060a / CPLT 3065a / HUMS 3061a, Bad Books** Kirk Wetters

Traditional humanities education always focused on "greatness"–but there is no denying the critical value and sometimes even the enjoyment of poor performances. In a world governed by norms and standards (against the appearance of laxness and relativism), "badness" and amateurism are inevitable. "Bad" works can be extremely popular and influential (e.g., in the cases of pseudoscience, misinformation, racism, antisemitism). The "bad" archive contributes to a reevaluation of critical standards,

forms of official and unofficial censorship, freedom of speech and the function of taboos. The course explores famous works that have been considered aesthetically, morally, ideologically and politically pernicious (stopping short, however, of screeds and manifestos like Hitler's *Mein Kampf*). Nevertheless, this course warrants a strong content warning. The range of our considerations will be partly based on the students' wishes and judgments. HU

*** GMAN 3100a / LING 1910a, "Sprachkrise" – Philosophies & Language Crises**
Sophie Schweiger

The crisis of language predates the invention of ChatGPT (who may or may not have helped write this syllabus). This course delves into the concept of language crises and its long history from a philosophical and literary perspective, examining how crises of language are represented in literature and how they reflect broader philosophical questions about language, identity, and power. We explore different philosophical approaches to language, such as the history of language and philology (Herder, Humboldt, Nietzsche), structuralism and post-structuralism (Saussure), analytical and pragmatic philosophies (Wittgenstein), phenomenology and deconstruction (Heidegger), and analyze how these theories shape our understanding of language while simultaneously evoking its crisis. The course also examines how such language crises are represented and produced in literature and the arts; how authors and artists approach the complexities of language loss, and how crises help birth alternative systems of signification. Through close readings of literary texts by Hofmannsthal, Musil, Bachmann, et. al., we analyze the symbolic and metaphorical significance of language crises, as well as the ethical and political implications of language loss for (cultural) identity. Experimental use of language such as DaDa artwork, performance cultures, and "Sprachspiel" poetry by the "Wiener Gruppe," as well as contemporary KI/AI literature, further complement the theoretical readings. By exploring language crises through the lens of philosophy and literature, we gain a deeper understanding of the role of language – and its many crises – in shaping our understanding of ourselves and our communities. HU

*** GMAN 3180a / CPLT 3180a / FILM 2827a / HUMS 3188a, Artificial Life: (Re)Production and the Limits of Humanity** Austen Hinkley

A mad scientist creates a living being in a laboratory; automata band together to overthrow their creators; a moving statue appears more lifelike than a human being. Such fantastical images and stories of artificial humanity haunt human culture, from ancient myths to contemporary media. This seminar explores such imaginations of the artificially human, with an emphasis on their role within German culture, in order to examine the often-hazy boundary between artificial production and organic reproduction. We will discuss the significance of this boundary for our understanding of topics such as literature, art, labor, gender, and psychology. Readings are drawn from sources both ancient and modern, from discourses including religion, philosophy, alchemy, literature, and psychoanalysis. In addition to readings, film and other visual materials will be incorporated as primary texts. HU

*** GMAN 3333a / HUMS 4333a, Kafka** Paul North

A name, a puzzle to be solved, a mirage-like figure provoking writers like Jorge Luis Borges to step beyond staid literary models, Jew, German, subject of the Kingdom of Bohemia, accident insurance lawyer, inventor of a device to make table saws safe, abject sufferer of tuberculosis, critic of philosophy and European culture, misogynist,

queer, dreamer and recorder of dreams, jokester, refuter of Kierkegaard, challenger to Nietzsche, fabulist, reader of Freud, reader of Flaubert, reader of..., writer of short prose pieces "in a single breath," diarist, novelist. Kafka. HU

* **GMAN 3460a / AMST 3334a / CPLT 3500a / FILM 3540a / HUMS 3466a, Uwe Johnson's Anniversaries: From A Year in the Life of Gesine Cresspahl** Austen Hinkley

Uwe Johnson's *Anniversaries: From A Year in the Life of Gesine Cresspahl* remains a monument of postwar German literature—and it was written in and about New York City. Across its 367 short chapters (each corresponding to a day of the year), the novel unfolds on three levels: the historical present in New York, memories and family history from Germany, and reporting from the New York Times on current events. The result is a view of life, politics, and history in the middle of the 20th century that is as rich and expansive as it is fragmented. The social and political climate of New York in the late '60s is put into contact with memories of the rise of Nazism in Germany; reporting on the Vietnam war, the civil rights movement and the Prague Spring is refracted through the lenses of the protagonist's past life in East Germany and her new life raising her daughter alone in New York. This course undertakes a close reading of Johnson's sprawling novel with attention to its many historical, political, and literary contexts. Readings from the novel are complemented by relevant short readings on theories of media, politics, literature, and history. No prior knowledge of German language and literature is required.
HU

* **GMAN 3620b / CPLT 4890b / HUMS 3720b, Critique and Crisis** Kirk Wetters

In our time, when everyone is suspected of being hyper-critical, it is not surprising that the limits of critique, its function and institutional location are called to question. The idea of "post-critique" has been much discussed in recent year. In order to gain orientation with respect to such concerns, this course develops critical models, primarily from the German tradition, in order to show the great variety of options available beyond the "hermeneutics of suspicion." Topics include: post-critique, the history of critique/criticism, the Romantic concept of critique, traditional vs. critical theory, historicism, philology vs. hermeneutics, science (Wissenschaft) vs. the critique of positivism. Main protagonists include Kant, Schiller, Schlegel, Nietzsche, Dilthey, Max Weber, Lukács, Husserl, Benjamin, Adorno, Koselleck, Szondi, Gadamer, Gumbrecht, Latour, Felski. HU

* **GMAN 4050a / CPLT 3940a / FILM 4680a, Weimar Cinema** Fatima Naqvi and Claire Demoulin

The German cinema, 1919–1930. Expressionist films and films of the New Objectivity. The pressures of technology and the other arts on cinema; issues of spectatorship, visual pleasure, and distraction. Readings by Simmel, Kracauer, Benjamin, and others. Films by Murnau, Lang, Lubitsch, Pabst, Brecht, von Sternberg, and others. Unless otherwise indicated, courses in this group are conducted in English with both readings and discussion in English. The courses are open to all students in Yale College. Conducted in English, with readings in English. HU

* **GMAN 4920a and GMAN 4930b, The Senior Essay Tutorial** Theresa Schenker

Preparation of an original essay under the direction of a faculty adviser.

Global Affairs (GLBL)

GLBL 1204a / CLCV 2691a / HIST 1702a, Global Leadership, 600 BCE–600 CE Staff
This course provides students with an accessible and engaging introduction to both the classical world and the problems of political organization and leadership through time and across societies. Students learn to think comparatively between individuals, societies, and systems and to analyze different ideals of leadership. This means considering not only traditional masculine and military conceptions of rule but also the leadership roles and styles of women, slaves, and rebels. We hope to bring into view, in other words, the intersectional challenges to power faced by non-traditional leaders in a world dominated by gender, class, and cultural prejudices, and to show how non-traditional leaders confronted and overcame these. Students draw upon this experience to access the premodern world as an alternative but related historical reality which can productively inform their engagement with the present. HU 0 Course cr

GLBL 1433a / HIST 1733a, The Twentieth Century: A World History Staff
For most people, almost everywhere, the twentieth century was a time of profound and accelerating change. Someone born in the 1890s could, if they lived a long life, have experienced two world wars, a global depression, collapse of empires, the enfranchisement of women and young people, and the rise of the United States to global power. They could have witnessed the first cars, the first planes, the first radios and TVs, and the first computers. They could have been among the first to swear allegiance to one (or several) of 130 new states, almost twice the number that existed in 1900. They would have been certain to witness massive ecological destruction, as well as unparalleled advances in medicine, science, and the arts. The twentieth century was, as one historian puts it, an age of extremes, and in this class we explore some of these aspects of the age. The class is not intended to be a complete history nor is it one that provides an integrative interpretation of historical events. The aim is rather to enable students to know enough to think for themselves about the origins of today's world and about how historical change is created. HU 0 Course cr

GLBL 2121a, Applied Quantitative Analysis Staff
This course is an introduction to statistics and their application in public policy and global affairs research. Throughout the term we cover issues related to data collection (including surveys, sampling, and weighted data), data description (graphical and numerical techniques for summarizing data), probability and probability distributions, confidence intervals, hypothesis testing, measures of association, and regression analysis. QR 0 Course cr

GLBL 2122b, Applied Quantitative Analysis II Staff
This course introduces students to multiple regression analysis and other tools of causal inference and program evaluation. The course focuses on applying these tools to real data on various topics in global affairs and public policy. Applications are drawn from a wide range of areas including education, social welfare, unemployment, security, health, immigration, the environment, and economic development. We develop the core analytical tools of single and multi-variable regression and discuss fixed effects, difference-in-difference, natural experiment, instrumental variables, regression discontinuity, event study, and matching approaches. Students are trained to thoughtfully produce their own empirical research and to critically consume empirical research done by others. Prerequisite: GLBL 121 or equivalent. QR 0 Course cr

GLBL 2159a or b / ECON 2159a or b, Game Theory Staff
An introduction to game theory and strategic thinking. Ideas such as dominance, backward induction, Nash equilibrium, evolutionary stability, commitment, credibility, asymmetric information, adverse selection, and signaling are applied to games played in class and to examples drawn from economics, politics, the movies, and elsewhere. After introductory microeconomics. No prior knowledge of game theory assumed. QR, SO
o Course cr

GLBL 2203a / PLSC 2105a, Globalization and Domestic Politics Staff
This course offers students a general introduction to the political consequences of economic globalization (e.g., the rise of populist parties). We identify the winners and losers of tariff policy, foreign aid, and monetary policy (e.g., a strong/weak dollar), and examine how domestic institutions—such as lobbying and electoral systems—reinforce the advantages enjoyed by globalization's winners, while also creating opportunities for losers to advocate for policy reversal. o Course cr

GLBL 2234b / ECON 2184b, International Economics Peter Schott
Introduction to conceptual tools useful for understanding the strategic choices made by countries, firms, and unions in a globalized world. After two terms of introductory economics. SO

GLBL 2251b / CPLT 2650b / EALL 2560b / EAST 2221b / HUMS 2720b, China in the World Jing Tsu
Recent headlines about China in the world, deciphered in both modern and historical contexts. Interpretation of new events and diverse texts through transnational connections. Topics include China's international relations and global footprint, language and script, Chinese America, science and technology, and science fiction. Special topic for AY 2025–2026 with guest speakers: AI, U.S.-China futurism, and tech policy Readings and discussion in English. HU o Course cr

GLBL 2283a / PLSC 2127a, Technology and War Staff
The course explores the international security implications of emerging technologies such as artificial intelligence, cyberweapons, hypersonic missiles, and so-called killer robots. The first half of the course offers a deep dive into the transformative military and civilian technologies of the 20th century, examining how doctrine and culture shaped the development, acquisition, and deployment of key systems like submarines, bomber aircraft, and nuclear bombs, and how these technologies, in turn, shaped international security. In the second half of the course, we apply the lessons of the past to make theoretically guided predictions. What norms will guide the use of new technologies, and what weapons should or should not be developed? Are arms races inevitable? What might improve the prospects for arms control of emerging technologies? SO o Course cr

GLBL 2357a / HIST 2623a, Palestine and Israel Laura Robson
This course traces the history of Palestine and Israel from the mid-nineteenth century to the present, focusing particularly on the genesis of the Arab-Israeli conflict and the construction of two opposing nationalist narratives attached to the same geographical space. In this class, we examine the political, social, economic, and cultural history of the region and trace the concurrent development of Palestinian and Israeli national identities during the nineteenth and twentieth centuries. We also consider the

historiography of the conflict and investigate some of the most prominent scholarly debates surrounding the history of the region. HU

GLBL 2383b / ECON 2160b, Games and Information Staff
This is designed to be a "second" game theory course. We build on the learnings from introductory game theory courses like ECON 159/GLBL 159, MGT 822 or the SOM core. The course aims to introduce important ideas and tools from game theory, and use them to answer questions in social sciences, law, and business. For instance, how does information get sold and used to persuade? How do we think about the efficiency and equity of allocations? How do sellers decide the best format for an auction to sell a good? Does requiring unanimous verdicts guarantee that the innocent will not be convicted? What causes bank runs? When do we see price wars? The underlying ideas will include games of incomplete information, mechanism design, common knowledge and high-order reasoning, and repeated games. Prerequisite: Any introductory game theory course, e.g., ECON/GLBL 159, MGT 822 or Game Theory in the SOM Core. SO RP o Course cr

GLBL 2392a, Intelligence, Espionage, and American Foreign Policy Staff
The discipline, theory, and practice of intelligence; the relationship of intelligence to American foreign policy and national security decision-making. Study of the tools available to analyze international affairs and to communicate that analysis to senior policymakers. Case studies of intelligence successes and failures from World War II to the present. o Course cr

GLBL 2427a / AFST 3381a / PLSC 2427a, Government and Politics in Africa Staff
The establishment and use of political power in selected countries of tropical Africa. The political role of ethnic and class cleavages, military coups, and the relation between politics and economic development. SO o Course cr

* **GLBL 3095a, Special Operations History and Policy** Phil Kaplan and Christopher Fussell
For two decades, the world has seen the role, funding, and employment of Special Operations Forces (SOF) increase in ways that would have been unrecognizable to previous generations of military leaders. While this phenomenon has been global to some degree, it has been by far the most pronounced in the United States. Driven by a sustained period of highly kinetic counterterrorism operations, the evolution of SOF has been one of the most significant developments in the military history of the 21st century. With that period of conflict now receding, and a period of sustained competition between near-peers dominating geopolitical dynamics, the role of SOF remains both contested and consequential. The goal of this course is to prepare students to think critically about the proper utilization of SOF—whether as informed citizens, military leaders, or civilian policymakers. Drawing on a diverse set of narrative, historical, legal, and other sources, the course will analyze SOF's recent expansion and explore what its future utilization might look like, based on the changing landscape of global conflict.

GLBL 3101b, Challenges in Global Affairs Jennifer Gandhi, Amit Khandelwal, and Alden Young
Challenges in Global Affairs is the singular core course for global affairs majors, intended for students in their junior year. The course is led by senior Jackson faculty and co-taught with other experts to delve into key topics in global affairs. The goal

is to teach students how to think systematically about a particular challenge through various lenses, especially those used in economics, history, and political science. The course is a mix of lectures and class discussions. We approach key topics from both a theoretical and a practical perspective. ***Note:*** Please ensure that you have the course prerequisites below before registering. This course is a requirement for the new global affairs major curriculum and open to global affairs majors only. Students may not enroll in this course without the following two courses (1) introduction to microeconomics (ECON 115 or equivalently ECON 110) or a higher-level microeconomics course; and (2) at least one History or Political Science course that has dealt with post-1945 history, politics, or international relations; or without instructor permission. SO 0 Course cr

* **GLBL 3102a, Introduction to Human Rights: Human Rights in a Turbulent World** Janine di Giovanni

This course explores war crimes and crimes against humanity through the lens of modern conflicts. Using investigations, civil society reports, reliable journalism, and firsthand witness testimonies, students analyze the impact of these crimes. The course covers topics such as case studies of current conflicts, including Syria, Israel/Gaza, Ukraine, and Yemen, and then it examines the Balkan and African wars of the 1990s and the lessons learnt (or not learnt) and patterns we see emerging in current conflicts. Students study the evolution of war crimes documentation since the 1990s, including the role of OSINT and DNA analysis of mass graves. An overall theme is accountability and transitional justice: exploring past international justice efforts and the challenges of truth-telling. This course serves as the common requirement for the Certificate in Human Rights and the Intensive Certificate in Human Rights programs. SO 0 Course cr

* **GLBL 3191b, Research Design and Survey Analysis** Justin Thomas

Introduction to research design through the analysis of survey data. Policy and management issues explored using data from the United States as well as from several developing countries. A bridge between the theory of statistics/econometrics and the practice of social science research. Use of the statistical package Stata. Prerequisites: GLBL 121 or equivalent, and an introductory course in statistics or econometrics. SO

GLBL 3211b / ECON 2201b, Introduction to Development Economics Lauren Bergquist

This course explores the causes of global poverty and the efficacy of policies designed to alleviate it. Topics to be covered in this course include poverty and inequality, global health, education, agriculture, savings, insurance, credit markets, labor markets, firm productivity, colonialism, slavery, democracy, and corruption. These topics will be approached through the lens of micro-economics, with a focus on the variety of tools available for rigorously measuring the impact of development policies and programs. *Econ 117 or GLBL 121 (or the equivalent).* SO

GLBL 3219b / ECON 3375b, Monetary Policy William English

Introduction to modern macroeconomic models and how to use the models to examine some of the key issues that have faced monetary policymakers during and after the global financial crisis of 2008–2009. Prerequisites: Intermediate level macroeconomics (ECON 122 or 126) and introductory econometrics. WR, SO 0 Course cr

* **GLBL 3225a, Approaches to International Development** Staff
Students interested in topics of international development gain practice in the various tools that practitioners, researchers, and policymakers use to answer development questions. Topics include history of development thought, economic growth, poverty, impact evaluations, education, development aid, and institutions. To practice development tools, students work on assignments with real-world data and learn how to create a policy report on a development topic of their choice. Enrollment limited to sophomores, juniors, and seniors. Prerequisite: GLBL 121 and its approved substitutes YC GLBL 121 Alternative Course QR, SO 0 Course cr

* **GLBL 3237a / ECON 2185a, Global Economy** Aleh Tsyvinski
A global view of the world economy and the salient issues in the short and the long run. Economics of crises, fiscal policy, debt, inequality, global imbalances, climate change. The course is based on reading, debating, and applying cutting edge macroeconomic research. SO

GLBL 3275b, Approaches to International Security Staff
Introduction to major approaches and central topics in the field of international security, with primary focus on the principal man-made threats to human security: the use of violence among and within states, both by state and non-state actors. Priority to Global Affairs majors. Non-majors require permission of the instructor. SO 0 Course cr

GLBL 3303a / EAST 2721 / SOCY 1702a, Inequality and Social Change in China Emma Zang
This course offers an introduction to major social and economic issues in contemporary China. It provides a survey of the ongoing reforms and the Chinese society in transition with a focus on selected policy issues. In most weeks, the first session is reserved for a lecture by the instructor or a guest lecturer, and the second session is reserved for student-led discussions of pre-circulated questions. SO

* **GLBL 3315a, Economics of the European Union** Marnix Amand
The functioning of the economy of the European Union, both from a theoretical perspective (trade theory, monetary union, etc.) and from a practical perspective. Particular emphasis on the recent crises of the last ten years with effort to put these crises in a larger geostrategic context. Prerequisites: ECON 110 or 115 and ECON 111 or 116. SO

* **GLBL 3344a / HIST 37783a / PLSC 3125a, Studies in Grand Strategy II** Michael Brenes
The study of grand strategy, of how individuals and groups can accomplish large ends with limited means. During the fall term, students put into action the ideas studied in the spring term by applying concepts of grand strategy to present day issues. Admission is by application only; the cycle for the current year is closed. This course does not fulfill the history seminar requirement, but may count toward geographical distributional credit within the History major for any region studied, upon application to the director of undergraduate studies. Prerequisite: PLSC 321. Previous study courses in political science, history, global affairs, or subjects with broad interdisciplinary relevance encouraged. SO 0 Course cr

*** GLBL 3358a / PLSC 31104a, The Geopolitics of Peace in Ukraine** Lauren Young
This seminar examines the war in Ukraine with a geopolitical lens focusing on its broader implications for both regional security and democracy. The outbreak of war in Ukraine in February 2022 quickly became a flashpoint in the region. Over two years later, the stakes are high and tensions are rising among transatlantic allies supporting Ukraine, both with arms and sanctions. This course evaluates the historical roots of the war and the fallout from a potential failure to effectively deter an authoritarian state from invading a sovereign neighbor. Our course of study includes the role of international stakeholders and multi-lateral institutions in the conflict, regional political and security dynamics and economic consequences. The humanitarian aspects of the war and its impact on civilian populations, human rights violations and the role of the media in shaping perceptions of the conflict is analyzed. Ultimately, what are the responsibilities of the international community in mitigating the human cost of conflict and the broader economic and policy implications? The aim of this course is both a comprehensive understanding of the conflict and its role in changing and shaping both security and democracy in region and further afield. WR, SO

*** GLBL 3363a / AFST 4406a / PLSC 3457a, Sexual Violence and War** Elisabeth Wood
Analysis of patterns of sexual violence in war. Assessment of how well scholars in various disciplines and policy analysts account for these patterns. SO

*** GLBL 3822a, Adversaries by Design: Deconstructing the Iran-US Relationship** Robert Malley
In this course, we take an in-depth look at relations between the United States and Iran from the 1979 Islamic revolution to today. The course does not purport to offer a comprehensive history of the bilateral relationship, but rather to examine the past in order to better appreciate the two governments' worldviews and the reasons behind a more than 40 year-old antagonism that remains one of the world's most dangerous. Our goal is to try to put ourselves in the shoes of US and Iranian decision-makers, internalize their respective narratives and assessments of the past, and seek to understand why each sees acts toward the other as they do. We focus in particular on the two nations' sense of (in)security, Iran's and the US's regional roles and ties to Mideast state and non-state actors, the nuclear question and nuclear negotiations, as well as the role and impact of US sanctions. The course will closely follow unfolding events and examine possible future scenarios in light of these historical lessons. Guest lecturers will join to offer Iranian and US perspectives.

*** GLBL 3828b, Reopening & Reimagining Africa** Harry Thomas
It is time to "reopen and reimagine Africa." This course requires students to research and redesign policies that are intended to help African nations emerge economically stronger and with a population that is better educated and healthier by 2050. We examine, analyze, and support and/or criticize the long-term policies of African nations. Students are required to engage up-and-coming African scholars, businesspersons, educators, and policymakers to ensure that the recommendations are not conceived in a vacuum. We examine the obstacles and challenges of Great Power Competition among the U.S., the PRC, Russia, and the EU on Africa and design alternative policies. SO

*** GLBL 3834a, What Role Should the U.S. Play in the World?** Leslie Tsou
Should the United States intervene in the affairs of other countries to act as the world's security force, protect its own interests, and promote its liberal democratic values? Should it stay out of world events and focus on problems at home? Or is there a

balance between "Interventionism" and "Isolationism," and, if so, what factors should the United States government take into account in determining this balance? These questions are as old as the United States itself, and the debate continues to rage today. This course examines these questions through the lens of the United States' recent engagements in the Middle East, focusing on the First Gulf War, the War on Terror, the Second Gulf War, Libya, Syria, Iran, Israel/Palestine, and the Gulf states of Saudi Arabia, and Oman as well as Ukraine/Russia. We consider whether the U.S. approach in each case was effective, not effective, or partly effective, and what factors contributed to that outcome. The factors we examine include but are not limited to U.S. security, business and economic interests, and human rights.

* **GLBL 3930a, Turning Points in Peace-building** Bisa Williams
This seminar examines the challenges that must be addressed when the fighting has stopped. Once a peace agreement is signed, real deal-making begins. Former rebels negotiate with their military commanders about relinquishing arms and working for a living; communities look for "peace dividends," refugees weigh options to return home; Governments try to assert authority despite how weakened they have become or new to the role they are; compatriots who opposed the peace settlement relentlessly try to undermine it. The international community, which often leads warring parties to the table, takes on a new role also, informing and sometimes deforming outcomes. Building a durable peace requires a sensitivity to the changing priorities of the signatories and international community, as well as the constituencies for whom the peace was achieved. Anchored in (but not limited to) the ongoing UN-supported peace agreement implementation process in Mali and the monitoring process of the Final Agreement to End Armed Conflict and Build a Stable and Lasting Peace in Colombia, the seminar considers peace-building processes from the perspectives of formerly warring parties, diplomats, NGOs, and civil society, providing students an opportunity to begin to catalogue strategies for building durable peace following conflict. SO

* **GLBL 4307b / ECON 4467b / ECON 467, Economic Evolution of the Latin American and Caribbean Countries** Ernesto Zedillo
Economic evolution and prospects of the Latin American and Caribbean (LAC) countries. Topics include the period from independence to the 1930s; import substitution and industrialization to the early 1980s; the debt crisis and the "lost decade"; reform and disappointment in the late 1980s and the 1990s; exploration of selected episodes in particular countries; and speculations about the future. Prerequisities: intermediate microeconomics and macroeconomics. SO

GLBL 4308a / ECON 4424a, Central Banking William English
Introduction to the different roles and responsibilities of modern central banks, including the operation of payments systems, monetary policy, supervision and regulation, and financial stability. Discussion of different ways to structure central banks to best manage their responsibilities. Prerequisites: Intermediate Microeconomics, Intermediate Macroeconomics, and Introductory Econometrics. SO o Course cr

* **GLBL 4310a / ECON 4407a, International Finance** Ana Fieler
A study of the implications of increasing integration of the world economy, through international trade, multinational production, and financial markets. Topics include foreign exchange markets, capital flows, trade and current account imbalances, coordination of monetary and fiscal policy in a global economy, financial crises

and their links to sovereign debt crises and currency devaluations. Prerequisite: intermediate macroeconomics or equivalent. SO o Course cr

* **GLBL 4394a / ANTH 4809 / ER&M 3594a / EVST 4422a / F&ES 422, Climate and Society: Perspectives from the Social Sciences and Humanities** Michael Dove
Discussion of the major currents of thought regarding climate and climate change; focusing on equity, collapse, folk knowledge, historic and contemporary visions, western and non-western perspectives, drawing on the social sciences and humanities. WR, SO

* **GLBL 4405a / PLSC 3456a, Self-Determination, Secession & Accommodation** Maria Jose Hierro
This seminar offers specialized instruction on self-determination and secession, combining insights from scholarly research with in-depth case study analysis to explore the complexity of contemporary secessionist conflicts. We focus on two key multinational states: Spain—an advanced Western democracy—examined through Catalonia's independence movement, and India—an influential Global South country—through the case of Tamil Nadu. The course also engages with other high-profile cases, such as Greenland, Somaliland, and Republika Srpska, paying particular attention to the role and strategic interests of the United States in shaping international responses and influencing the trajectory of these conflicts. Students should have taken at least one Comparative Politics and/or International Relations introductory course. SO

* **GLBL 4425a, Atrocity Prevention** David Simon
Can atrocities be prevented? This course considers the ways in which episodes of genocide, crimes against humanity, and war crimes might be preventable. It looks at ways in which models of atrocities yield corresponding models of prevention, and then what policies those models, in turn, recommend. We consider a broad number of cases of prevention, devoting attention to the different phases and agents of the prevention efforts in question. We analyze the extent to which prevention efforts at different levels have been successful while being mindful of the costs that accompanied them. We aim to draw conclusions about what strategies key actors can deploy to reduce the incidence of mass atrocities throughout the world. SO

* **GLBL 4450a, Directed Research** Bonnie Weir
Independent research under the direction of a faculty member on a special topic in global affairs not covered in other courses. Permission of the director of undergraduate studies and of the instructor directing the research is required.

* **GLBL 4499a, Senior Capstone Project** Staff
Students work in small task-force groups and complete a one-term public policy project under the guidance of a faculty member. Clients for the projects are drawn from government agencies, nongovernmental organizations and nonprofit groups, and private sector organizations in the United States and abroad. Projects and clients vary from year to year. Fulfills the capstone project requirement for the Global Affairs major.

* **GLBL 4830a / ECON 4465a / EP&E 4224a, Debating Globalization** Ernesto Zedillo
Facets of contemporary economic globalization, including trade, investment, and migration. Challenges and threats of globalization: inclusion and inequality, emerging global players, global governance, climate change, and nuclear weapons proliferation. Prerequisite: background in international economics and data analysis. Preference to seniors majoring in Economics or EP&E. SO RP

Global Health Studies (HLTH)

* **HLTH 0810a or b, Current Issues in Medicine and Public Health** Robert Bazell
Analysis of issues in public health and medicine that get extensive media attention and provoke policy debates. The Covid-19 pandemic has revealed severe challenges in the communication between science and health experts and the public. Thus, a prime focus is a survey of epidemiology and related topics such as vaccination attitudes. The class covers other topics including (but not limited to) the value of cancer screening, genetic testing, the U.S. role in global health, physician assisted suicide and the cost of health care. Students learn to understand the scientific literature and critique its coverage in popular media–as well as producing science and medical journalism themselves. Enrollment limited to first-year students. Prerequisite: AP Biology or equivalent. SC

* **HLTH 3270a, Critical Thinking in Global Health Practice** Kristina Talbert-Slagle
The practice of global health involves thousands of people and millions of dollars around the world. But what, exactly, *is* global health practice? Who is doing it? How is it done? Where? And why? In this course, we examine and critique the who, what, when, where, why, and how of global health practice. Course content interweaves broadly-focused theory, examination, and critique of global health practice with specific examples and first-person accounts from the lived experiences of the professor and her longtime collaborators in Liberia. The learning experiences provided by this course lies not only in discussion of the assigned materials, but also in self-examination throughout the semester as we collectively reflect on both the course content and our own reactions to it. Students enrolling in this course must commit to engage thoroughly in the material and in the critical thinking and discussion that are necessary for their learning, and they should be willing to challenge the professor and each other constructively as part of the "critical thinking" component of the course. (We work together to make a safe and comfortable space for this.)

* **HLTH 4900a, Global Health Research Colloquium** Staff
This course is designed for Global Health Scholars in their senior year as they synthesize their academic studies and practical experiences during their time in the Global Health Studies MAP. In this weekly seminar, Global Health Scholars analyze central challenges in global health and discuss methodological approaches that have responded to these pressing global health concerns. In addition to close reading and discussion, students present on a topic of their choosing and contribute to shaping the agenda for innovative methods in global health research and policy. Prerequisite: HLTH 230 or permission of the instructor. This is a required course for Global Health Scholars and enrollment is limited to Global Health Scholars. RP

Hebrew (HEBR)

HEBR 1100a, Elementary Modern Hebrew I Dina Roginsky
Introduction to the language of contemporary Israel, both spoken and written. Fundamentals of grammar; extensive practice in speaking, reading, and writing under the guidance of a native speaker. L1 1½ Course cr

HEBR 1170a / RLST 1030a, Elementary Biblical Hebrew I Dina Roginsky
An introduction to biblical Hebrew. Intensive instruction in grammar and vocabulary, supplemented by readings from the Bible. No prior knowledge of Hebrew required. L1

HEBR 1200b, Elementary Modern Hebrew II Orit Yeret
Continuation of HEBR 110. Introduction to the language of contemporary Israel, both spoken and written. Fundamentals of grammar; extensive practice in speaking, reading, and writing under the guidance of a native speaker. Prerequisite: HEBR 110 or equivalent. L2 1½ Course cr

HEBR 1270b, Elementary Biblical Hebrew II Eric Reymond
Continuation of HEBR 117. Prerequisite: HEBR 117. L2

* **HEBR 1300a, Intermediate Modern Hebrew I** Orit Yeret
Review and continuation of grammatical study, leading to a deeper understanding of style and usage. Focus on selected readings and on writing, comprehension, and speaking skills. Prerequisite: HEBR 1200 or equivalent. L3 RP 1½ Course cr

* **HEBR 1370a, Intermediate Biblical Hebrew I** Eric Reymond
Review and continuation of grammatical study leading to a deeper comprehension of biblical Hebrew style. Focus on extended reading of biblical narrative, poetry, prophecy, and Wisdom texts. Prerequisite: HEBR 1270 or equivalent. L3

HEBR 1400b, Intermediate Modern Hebrew II Netta Sovinsky
Continuation of HEBR 130. Review and continuation of grammatical study leading to a deeper comprehension of style and usage. Focus on selected readings and on writing, comprehension, and speaking skills. Prerequisite: HEBR 130 or equivalent. L4 RP 1½ Course cr

* **HEBR 1510a / JDST 4209 / MMES 1159a, Conversational Hebrew: Israeli Media** Shiri Goren
An advanced Hebrew course for students interested in practicing and enhancing conversational skills. Focus on listening comprehension and on various forms of discussion, including practical situations, online interactions, and content analysis. Prerequisite: HEBR 1400 or permission of instructor. L5

* **HEBR 1570a / JDST 4205a, Reading Between the Panels: Visual Narratives and the Culture of Hebrew Graphic Novels** Shiri Goren
Focusing on Hebrew graphic novels, an emerging genre in contemporary Israeli literature this course provides an opportunity for advanced Modern Hebrew students to engage with complex and creative narratives representing diverse aspects of Israeli society. The class focuses on developing, enhancing, and strengthening students' linguistic performances across the four language domains. Simultaneously, students engage in a high-level theoretical and textual analysis of the works in question. Most of the works studied have not been translated into English or other languages. Therefore, the only way for students to access the majority of these compelling texts is by reading them in the target language. Prerequisite: Placement exam or permission of instructor. L5, HU RP

* **HEBR 1640b / JDST 4217 / MMES 1167b, Biblical to Modern Hebrew for Reading Knowledge** Dina Roginsky
Instruction in the linguistic needs of students who have reading knowledge of Biblical Hebrew but cannot read or converse in Modern Hebrew. Concentration on reading comprehension of Modern Hebrew for research purposes, particularly scholarly texts tailored to students' areas of interest. Two years of Biblical or Modern Hebrew studies, or permission of the instructor. RP

* **HEBR 1690b / JDST 4203 / LING 1650b / MMES 1162b, Languages in Dialogue: Hebrew and Arabic** Dina Roginsky
Hebrew and Arabic are closely related as sister Semitic languages. They have a great degree of grammatical, morphological, and lexical similarity. Historically, Arabic and Hebrew have been in cultural contact in various places and in different aspects. This advanced Hebrew language class explores linguistic similarities between the two languages as well as cultural comparisons of the communities, built on mutual respect. Students benefit from a section in which they gain a basic exposure to Arabic, based on its linguistic similarity to Hebrew. Conducted in Hebrew. Prerequisite: HEBR 1400, or placement test, or permission of the instructor. L5, HU RP

Hindi (HNDI)

* **HNDI 1100a, Elementary Hindi I** Swapna Sharma
An in-depth introduction to modern Hindi, including the Devanagari script. A combination of graded texts, written assignments, audiovisual material, and computer-based exercises provides cultural insights and increases proficiency in understanding, speaking, reading, and writing Hindi. Emphasis on spontaneous self-expression in the language. No prior background in Hindi assumed. L1 1½ Course cr

HNDI 1300a, Intermediate Hindi I Mansi Bajaj
The first half of a two-term sequence designed to develop proficiency in the four language skills. Extensive use of cultural documents including feature films, radio broadcasts, and literary and nonliterary texts to increase proficiency in understanding, speaking, reading, and writing Hindi. Focus on cultural nuances and Hindi literary traditions. Emphasis on spontaneous self-expression in the language. After HNDI 120 or equivalent. L3 1½ Course cr

* **HNDI 1320a, Accelerated Hindi I** Mansi Bajaj
A fast-paced course designed for students who are able to understand basic conversational Hindi but who have minimal or no literacy skills. Introduction to the Devanagari script; development of listening and speaking skills; vocabulary enrichment; attention to sociocultural rules that affect language use. Students learn to read simple texts and to converse on a variety of everyday personal and social topics. L3

HNDI 1500a, Advanced Hindi Swapna Sharma
An advanced language course aimed at enabling students to engage in fluent discourse in Hindi and to achieve a comprehensive knowledge of formal grammar. Introduction to a variety of styles and levels of discourse and usage. Emphasis on the written language, with readings on general topics from newspapers, books, and magazines. Prerequisite: HNDI 140 or permission of instructor. L5

* **HNDI 1980a, Advanced Tutorial** Swapna Sharma
For students with advanced Hindi language skills who wish to engage in concentrated reading and research on material not otherwise offered by the department. Work must be supervised by an adviser and must terminate in a term paper or the equivalent. Permission to enroll requires submission of a detailed project proposal and its approval by the language studies coordinator. Prerequisite: HNDI 150 or equivalent.

History (HIST)

*** HIST 0131a, What Makes An American?: U.S. National Identity, Founding to Present** Alvita Akiboh

What makes someone an "American"? This question has plagued the United States since its inception. Most countries, in constructing their national identity, point to shared language, culture, or ethnicity. The United States, on the other hand, has been called a "nation of immigrants," a "melting pot," or a "mosaic." These terms seek to describe how disparate groups of people from all over the globe have come together to form a nation. In this course, students grapple with questions of who has been considered "American" at different points in U.S. history, how the boundaries of this U.S national community have been policed, and why those boundaries have changed over time to allow some to become American while continuing to exclude others. Enrollment limited to first-year students. WR, HU

*** HIST 172Jb / AFAM 3170b / HSHM 4630b, Care Work: Intersectional Pedagogical, Experiential, and Theoretical Approaches to Healing** Ayah Nuriddin

What does it mean to "care"? What models of care work do we need to attend to current crises? What models of care work can we learn from the past? Can we imagine a world where the concept of care, in its most inclusive, embracing, holistic, liberatory form operates as a fundamental value driving our global societies? These are some of the questions that inspired the creation of this course. In this seminar, students explore theoretical feminist, Black feminist, and Crip-of-Color perspectives of care work as well as experiential healing modalities that might interrupt cycles of harm often experienced by care workers. HU

HIST 236a / HIST 1236a / HSHM 2260a, The Global Scientific Revolution Staff

The material, political, cultural, and social transformations that underpinned the rise of modern science between the 14th and 18th century, considered in global context. Topics include artisanal practices and the empirical exploration of nature; global networks of knowledge and trade, and colonial science; figurative arts and the emersion of a visual language of anatomy, astronomy, and natural history. HU o Course cr

HIST 304b / EAST 2321b, The History of Modern China, 1911-2025 George Remisovsky

An introduction to modern Chinese history spanning from the fall of the Qing Empire to the present. Examines the factors that led to the end of China's dynastic system, the political and social divisions that emerged after the Qing Dynasty's collapse, and the various alternative visions for China's future that have arisen from the late nineteenth century onward. Focuses on aspects of political, economic, and social history. HU o Course cr

HIST 305a / LAST 1100a, Introduction to Latin American Studies: History, Culture and Society Lorena Ojeda-Davila

This course provides a political and social introduction to Latin America and the Caribbean, an extraordinarily diverse group of countries in the Western Hemisphere. Latin America is often presented as a region characterized by poverty, inequality, crime, drugs, political instability, and armed conflict. However, this stereotype does not reflect the remarkable economic and political development over the last few decades. While social, legal, political, and economic factors vary within and between the countries of the region, since the 1980s, many countries that faced authoritarian

regimes transitioned to democracy; Most children in the region now have access to healthcare and attend school; The subcontinent is at the center of the climate justice agenda while dealing with new forms of colonialism from the "Global North"; Latin America is pioneering women's inclusion in politics, parity policies, and legal landmarks to combat gender-based political violence; Latin American feminism, queer activism, and movements advocating for the rights of black people, indigenous communities, and environmental protection are vibrant and have achieved pivotal accomplishments. Still, some governance challenges persist, and new ones have emerged. HU

* **HIST 0607b and HIST 0622b, Monks, Sufis, and Asceticism in the Medieval Middle East** Staff

Ascetic practices like fasting, spiritual seclusion, intensive prayer, and abstinence were common across the medieval Middle East, and were the monopoly of no one religious group. Asceticism (Greek askēsis, Arabic zuhd) acted as a path to try to achieve a surpassing degree of holiness and was often practiced in combination with mystic practices by which ascetics sought to contemplate God to become nearer to —or perhaps even one with—the divine. This course examines the long history of asceticism in the medieval Middle East, focusing on dominant ascetic trends within Christianity and Islam, namely monasticism and Sufism, respectively. It considers the context in which both developed, the long-lasting influence of each upon the other, and the role played by ascetic practitioners in other religious groups, such as pagans, Manichaeans, and most of all, Jews. We see throughout the course that even within each religious tradition, a diverse array of linguistic, cultural, and sectarian groups devoted themselves to different ascetic and mystic practices, and we consider what meanings these individuals attached to their actions. Enrollment limited to first-year students. WR, HU

* **HIST 0623b / HUMS 0360b / JDST 0035b / RLST 0035b, Jerusalem: Judaism, Christianity, Islam** Sarit Kattan Gribetz

The Old City of Jerusalem is just 0.35 square miles large, about half the size of Yale's campus. Have you ever wondered what makes this tiny city so beloved to—and the object of continual strife for—Jews, Christians, and Muslims? Through engagement with a wide range of sources—including biblical lamentations, archeological excavations, qur'anic passages, exegetical materials, medieval pilgrim itineraries, legal documents, maps, poetry, art, architecture, and international political resolutions—students develop the historiographical tools and theoretical frameworks to study the history of one of the world's most enduringly important and bitterly contested cities. Students encounter persistent themes central to the identity of Jerusalem: geography and topography; exile, diaspora, and return; destruction and trauma; religious violence and war; practices of pilgrimage; social diversity; missionizing; the rise of nationalism; peace efforts; the ethics of storytelling; and the stakes of studying the past. Enrollment limited to first-year students. HU RP

* **HIST 0722a, What History Teaches** John Gaddis

An introduction to the discipline of history. History viewed as an art, a science, and something in between; differences between fact, interpretation, and consensus; history as a predictor of future events. Focus on issues such as the interdependence of variables, causation and verification, the role of individuals, and to what extent historical inquiry can or should be a moral enterprise. Enrollment limited to first-year students. WR, HU

*** HIST 0724a / CLCV 0531a, The Age of Cleopatra** Joseph Manning
This course introduces students to historical method using a pivotal and fascinating period in Mediterranean history. This course goes far beyond the typical framework, mainly from Roman sources, to examine Egypt in the age of Cleopatra, 50–30 BCE and the much wider world. We examine the reception of Cleopatra through the lens of women's history. Enrollment is limited to first-year students. WR, HU

*** HIST 0737a, History of Indian Ocean Crossings** Nurfadzilah Yahaya
This seminar explores the history of the Indian Ocean from the Red Sea region to South Asia, and onward to Southeast Asia through two creative works by Amitav Ghosh. The first work is *In an Antique Land*, an autobiographical account of his time in Egypt as an anthropologist in the late twentieth century that he interspersed with that of the history of a Jewish merchant in Aden and Malabar in the twelfth century when Indian Ocean trade formed the backbone of international economy. The second book, *Sea of Poppies* is the first novel in his epic trilogy on the Indian Ocean, which traces the journey of a diverse group people from the Indian subcontinent to Southeast Asia and China during the nineteenth century. This seminar breaks out of conventional regional fields by closely following historical actors on the ground. Each session explores several core themes for historical research namely commerce, mobility, labor, climate, cosmopolitanism, colonialism, and modernization. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** HIST 0742a, Comparative Women's History** Rebecca Tannenbaum
Comparative perspective on the lives of women and their experiences, the ways in which historical forces shaped gender roles in different cultures, and the similarities and differences in gender roles across different time periods and around the world. Topics include work, family roles, political participation, health and sexuality, religious roles, and global feminisms. Enrollment limited to first-year students. WR, HU

HIST 1114a / HSHM 2060a, Histories of American Reproductive Health, Rights, and Activism from 1800 Staff
Are all politics reproductive politics? This course traces the reproductive history of the United States from the early nineteenth century to the present day. Questions about reproduction—and about not reproducing—are deeply tied to questions of gendered and racial rights; of bodily autonomy; of American expansion and empire; and of who counts as a citizen, or even as a human being. In the past few years, we've encountered new stories about everything from new and restrictive abortion laws, to immigrant woman who were sterilized without their consent, to new technologies in male birth control, to the inequitable childcare burden that falls to women during times of hardship, to the racist roots of foster care and residential school systems. In this course, we come to understand the historical changes in American reproduction to better understand the complicated roots of our current moment. By analyzing articles in newspapers and scientific journals, advertisements, film, patient and physician narratives, and exhibitions and material culture, students will understand reproduction as a site for empowerment and activism, as a site of medical professionalization, and as a site of health disparity. We examine reproduction capaciously, including pregnancy and childbirth, birth control and abortion, assistive reproductive technologies, and adoption and foster care. Our analysis is intersectional, and we consider what different identities meant for reproduction historically, as well as in our current moment. HU
o Course cr

HIST 1120a / AMST 1120a / EVST 1120a / HSHM 2040a, American Environmental History Staff
Ways in which people have shaped and been shaped by the changing environments of North America from the nineteenth century to the present. Migration of species and trade in commodities; the impact of technology, agriculture, and industry; the development of resources in the American West and overseas; the conservation and environmental movements; planning and the impact of public policies; automobiles, highways, and urban growth; toxic chemicals, radiation, and environmental justice; climate change and energy transitions. WR, HU o Course cr

HIST 1122a / DEVN 2000a, America at 250: A History Staff
This one-time-only course examines U.S. history from 1776 to the present, in advance of the nation's semiquincentennial (or 250th birthday) in 2026. Taught jointly by Professors Joanne Freeman, David Blight, and Beverly Gage, the course emphasizes the history of the nation-state and the contested nature of American national identity. The class explores U.S. political history broadly conceived—not just as a realm of presidents and elections and wars (though there will be plenty of those) but as a conversation across time between citizens about what the United States is, was, and was meant to be. It proceeds from the premise that the American Revolution was the first but not the last radical act of national reimagining in U.S. history. HU o Course cr

HIST 1125a / AMST 1197a / ARCH 2600a / HSAR 3219a / URBN 1101a, American Architecture and Urbanism Staff
Introduction to the study of buildings, architects, architectural styles, and urban landscapes, viewed in their economic, political, social, and cultural contexts, from precolonial times to the present. Topics include: public and private investment in the built environment; the history of housing in America; the organization of architectural practice; race, gender, ethnicity and the right to the city; the social and political nature of city building; and the transnational nature of American architecture. HU o Course cr

HIST 1129b / HSHM 2490b, The Good Death: A History Deborah Streahle
Can a death be "good" or "bad?" How so? Who gets to decide? Students in this course trace how the idea of "the good death" changed through U.S. history. Together, we consider several questions that have been used to evaluate the "goodness" of a death, asking: Is there a right time to die? Can a good death be planned? Is there a right attitude or spiritual stance to have toward death? Where does a good death take place? What kind of care is best for dying people? What should be done with dead bodies? How does grief factor into the good death? Over the semester, students investigate both aspirational visions of the good death as well as the realities of death in U.S. history. We analyze cultural, social, and medical factors that influenced the professionalization and medicalization of death into the 21st century. In addition, students are asked to probe their own assumptions about the good death and its corollary, the good life. The course culminates in an essay that features self-reflection as well as rigorous historical analysis. HU o Course cr

HIST 1131a / AFAM 2150a / ER&M 2534a / HSHM 2520a, History of Anti-Black Racism and Medicine Staff
The course traces how anti-Black racism shaped the development of western medicine in the Americas. It examines how ideas of anti-Blackness shaped the work of health practitioners and the experiences of patients. It engages the emergence of racial

science and scientific racism, and how they contributed to the production of medical knowledge. More importantly, it centers the voices and experiences of Black people, and the various ways challenged racism through knowledge production and activism. It also addresses the enduring legacies of anti-Black racism in medical practice, and its impact on health inequality. HU o Course cr

HIST 1183a / AMST 2272a / ER&M 2682a / WGSS 2272a, Asian American History, 1800 to the Present Staff
An introduction to the history of East, South, and Southeast Asian migrations and settlement to the United States from the late eighteenth century to the present. Major themes include labor migration, community formation, U.S. imperialism, legal exclusion, racial segregation, gender and sexuality, cultural representations, and political resistance. HU o Course cr

HIST 1212a / CLCV 2685a, The Ancient Economy Staff
A survey of the economies of the ancient Mediterranean world, with emphasis on economic institutions, the development of the economies over time, ancient economic thought, and the interrelationships between institutions and economic growth. Material evidence for studying the economies of the ancient world, including coinage, documentary material, and archaeology. HU o Course cr

HIST 1215a / RLST 2830a, Reformation Europe, 1450–1650 Staff
Examination of a series of religious revolutions in Europe between 1450 and 1650. The causes and nature of the reformations that changed the religious, political, social, and economic landscapes of early modern Europe and shaped the course of Western civilization as a whole. HU o Course cr

HIST 1217a / CLCV 2501a / HUMS 2501a, The Roman Republic Staff
The origins, development, and expansion of Rome from the earliest times to the deaths of Caesar and Cicero. Cultural identity and interaction; slavery, class, and the family; politics, rhetoric, and propaganda; religion; imperialism; monumentality and memory; and the perception and writing of history. Application of literary and archaeological evidence. HU o Course cr

HIST 1218b / CLCV 2502b, The Roman Empire Andrew Johnston
The history of the Roman Empire from its establishment by Augustus to the reign of Justinian. Attention to social, intellectual, and religious changes, as well as to the framework of historical events within which these changes took place, and to the processes by which the Roman Empire was replaced by the institutions of the Western Middle Ages and the Byzantine Empire. HU o Course cr

HIST 1219a / ER&M 2519a / JDST 200 / JDST 2000a / MMES 1149a / RLST 1480a, Jews and the World: From the Bible through Early Modern Times Ivan Marcus
A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings. Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP o Course cr

HIST 1229a, From Oligarchy to Democracy in Britain, 1780–1914 Staff
British politics, society, and culture in the long nineteenth century, a period of constitutional reform, industrial development, social dislocation, imperial expansion, and cultural criticism. HU o Course cr

HIST 1231b / HUMS 277, European Intellectual History from Renaissance to Revolution Isaac Nakhimovsky
A survey of eighteenth-century European intellectual life, considered in its social and cultural contexts and with attention to its historical legacies, focusing on responses to emerging global networks of trade, finance, and empire. HU o Course cr

HIST 1236a / HIST 236a / HSHM 2260a, The Global Scientific Revolution Staff
The material, political, cultural, and social transformations that underpinned the rise of modern science between the 14th and 18th century, considered in global context. Topics include artisanal practices and the empirical exploration of nature; global networks of knowledge and trade, and colonial science; figurative arts and the emersion of a visual language of anatomy, astronomy, and natural history. HU o Course cr

HIST 1254a / GMAN 2080a, Germany from Unification to Refugee Crisis Staff
The history of Germany from its unification in 1871 through the present. Topics include German nationalism and national unification; the culture and politics of the Weimar Republic; National Socialism and the Holocaust; the division of Germany and the Cold War; the Student Movement and New Social Movements; reunification; and Germany's place in contemporary Europe. HU o Course cr

HIST 1257a, England and Its Empire, 1485–1783 Staff
In 1485, England had just struggled through the internal Wars of the Roses, between Yorkist and Lancastrian factions. It was a medium-sized kingdom that had not even managed to control the entirety of its home island, and had a small part of Ireland as its sole overseas possession. In 1764, Great Britain had just won a decisive victory over France in the Seven Years' War. It controlled the entirety of Britain and Ireland, possessed the second largest overseas empire in history, and was richer than any other European state. But then, in the space of the next two decades, the empire seemed to disintegrate as thirteen American colonies won their independence. This course examines how all that happened, both through the eyes of professional historians and the historical figures themselves. We are guided in this course by two critical questions: How did English monarchs, ministers, and merchants build the most effective European imperial state of its time? And what was the cost? HU o Course cr

HIST 1265a / RSEE 2660a, Soviet Russia 1917–1991 Staff
Overview of the rise and fall of the Soviet Union. Topics include political culture and ideology of the Bolshevik/Communist Party; social and economic changes; foreign policy and the role of WWII; major artistic and cultural movements. Paper assignments involve close readings of memoir and oral history accounts. HU o Course cr

HIST 1280b / ITAL 1315b / RLST 1600b, The Catholic Intellectual Tradition Carlos Eire
Introductory survey of the interaction between Catholicism and Western culture from the first century to the present, with a focus on pivotal moments and crucial developments that defined both traditions. Key beliefs, rites, and customs of the Roman Catholic Church, and the ways in which they have found expression; interaction

between Catholics and the institution of the Church; Catholicism in its cultural and sociopolitical matrices. Close reading of primary sources. HU o Course cr

HIST 1290a / RSEE 2225a, Russia from the Ninth Century to 1801 Staff
The mainstream of Russian history from the Kievan state to 1801. Political, social, and economic institutions and the transition from Eastern Orthodoxy to the Enlightenment. HU o Course cr

HIST 1340b / AFST 3340b, Africa in the Era of the Slave Trade Robert Harms
Examination of the tumultuous changes experienced by African societies during the era of the Atlantic slave trade, approximately 1450–1850. Focus on the complex interaction between the internal dynamics of African societies and the impact of outside forces. HU o Course cr

* **HIST 1344a / AFST 3344a, African Independence: A Cup of Plenty or a Poisoned Chalice?** Staff
In every African colony after World War Two there emerged nationalist movements which no longer called for civil rights as in the pre-war years but demanded self-determination. While many of them got it easy, some had to fight long and bloody wars for it. By the 1960s the colonial edifice had crumbled except for the few settler colonies in southern Africa. But even here the winds of change could not be stopped. But what did decolonization and independence mean to Africa? Did Africans get what they wanted? Was independence a cup of plenty or a poisoned chalice? In addressing these questions, this course charts the economic, political, and cultural transformations of postcolonial Africa from the 1960s to the present. The argument is this: there can be no understanding of Africa's challenges today without an inquiry into the nature of what the continent got from the departing colonial powers. HU o Course cr

HIST 1421a / EAST 2301a, China from Present to Past Staff
Underlying causes of current issues facing China traced back to their origins in the premodern period. Topics include economic development, corruption, environmental crises, gender, and Pacific island disputes. Selected primary-source readings in English, images, videos, and Web resources. Preference given to first years and sophomores. WR, HU o Course cr

HIST 1568b / ER&M 3568 / LAST 1368, Political Violence, Citizenship, and Democracy in Latin America Marcela Echeverri Munoz
Exploration of how and when definitions of citizenship and democracy have been shaped by violent conflicts; how local and global contexts have influenced individual and collective political action; and the transformation of leadership, ideologies, and utopias in different Latin American contexts. WR, HU o Course cr

HIST 1645b / JDST 3265 / MMES 1148 / RLST 2020b, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus
Jewish culture and society in Muslim lands from the time of the Prophet Muhammad to that of Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU o Course cr

HIST 1701b, History of Dutch Empire Nurfadzilah Yahaya
This lecture course introduces the history of the Dutch Empire which consists of territories throughout North America, the Caribbean, South America, Africa, Oceania, Asia, and the Indian Ocean from the seventeenth century till the present day. Compared

to other European empires, the history of the Dutch Empire is lesser known although its impact was truly global. We study the history of the nascent Dutch Republic coming out from under Spanish rule and trace Dutch voyages across the Atlantic and the Indian Ocean through the histories of the earliest chartered companies, the Dutch East India Company which dominated Sri Lanka and Netherlands East Indies (present-day Indonesia), and the Dutch West India Company in North America, the Caribbean and Brazil. We also look at how the Dutch became deeply involved in Atlantic slave trade and the Indian Ocean. We explore how with the demise of both companies, the Dutch government took direct control all over the world, and strove to maintain control and legacies of Dutch rule. Towards the late nineteenth century, Dutch imperialists altered their colonial strategies to grant more autonomy to subjects. We end by exploring the legacies of the Dutch Empire in the world. HU 0 Course cr

HIST 1702a / CLCV 2691a / GLBL 1204a, Global Leadership, 600 BCE–600 CE Staff
This course provides students with an accessible and engaging introduction to both the classical world and the problems of political organization and leadership through time and across societies. Students learn to think comparatively between individuals, societies, and systems and to analyze different ideals of leadership. This means considering not only traditional masculine and military conceptions of rule but also the leadership roles and styles of women, slaves, and rebels. We hope to bring into view, in other words, the intersectional challenges to power faced by non-traditional leaders in a world dominated by gender, class, and cultural prejudices, and to show how non-traditional leaders confronted and overcame these. Students draw upon this experience to access the premodern world as an alternative but related historical reality which can productively inform their engagement with the present. HU 0 Course cr

HIST 1703b, The World Circa 1800 Stuart Semmel
Global history studies cross-cultural interactions, connections, influences, and conflicts. Our subjects include: colonial expansion; war and resistance; slavery; migration and diaspora; the diffusion of ideas and technologies; and the transplanting of crops, livestock, and bacteria. Looking at the world around 1800 lets us consider the impact of European imperial expansion, the French revolution, religious movements, industrialization, and the "international" emergence of "nationalism." We consider and explore the very notions of "modernization" and "globalization." HU 0 Course cr

HIST 1712b, History of Pandemics Zeinab Azarbadegan
Diseases, especially pandemic ones, are not confined to a mere scientific medical issue. They are a social phenomenon, where even the medical discourse is shaped by the societies they emerge from. This course provides an overview of how global pandemics have been understood and dealt with since ancient times to now. We explore issues such as the evolution of medical discourses about the spread of diseases, how states and governments deal with pandemics, how a global public health regime was established, and what has been its triumphs and failures among others. HU 0 Course cr

HIST 1727a / EVST 2206a / HSHM 2010a / HUMS 1060a / PHYS 1060a, Sustainable Energy: Physics and History
Students explore the physical logic of energy and power in parallel with the histories of technology for energy exploitation and economic theories of sustainability on the path to modernity. They learn the fundamentals of quantitative analysis of contemporary and historical energy harvesting, its carbon intensity, and climate impact. They also gain an understanding of the historical underpinnings of the current global energy

status quo and its relationship to economic theories of sustainability. Mathematical proficiency with algebra is assumed. Students from all academic interests and experiences are welcome in the course. QR, SC, SO 0 Course cr

HIST 1733a / GLBL 1433a, The Twentieth Century: A World History Staff
For most people, almost everywhere, the twentieth century was a time of profound and accelerating change. Someone born in the 1890s could, if they lived a long life, have experienced two world wars, a global depression, collapse of empires, the enfranchisement of women and young people, and the rise of the United States to global power. They could have witnessed the first cars, the first planes, the first radios and TVs, and the first computers. They could have been among the first to swear allegiance to one (or several) of 130 new states, almost twice the number that existed in 1900. They would have been certain to witness massive ecological destruction, as well as unparalleled advances in medicine, science, and the arts. The twentieth century was, as one historian puts it, an age of extremes, and in this class we explore some of these aspects of the age. The class is not intended to be a complete history nor is it one that provides an integrative interpretation of historical events. The aim is rather to enable students to know enough to think for themselves about the origins of today's world and about how historical change is created. HU 0 Course cr

HIST 1744b / HSHM 2321b, Cultures of Western Medicine John Warner
A survey of Western medicine and its global encounters, encompassing medical theory, practice, institutions, and healers from antiquity to the present. Changing concepts of health, disease, and the body in Europe and America explored in their social, cultural, economic, scientific, technological, and ethical contexts. HU 0 Course cr

* **HIST 1759a / CPLT 3450a / EVST 2228a / HUMS 2228a, Climate Change and the Humanities** Katja Lindskog
What can the Humanities tell us about climate change? The Humanities help us to better understand the relationship between everyday individual experience, and our rapidly changing natural world. To that end, students read literary, political, historical, and religious texts to better understand how individuals both depend on, and struggle against, the natural environment in order to survive. HU

HIST 1763a / HSHM 2330a, The Politics of Global Health, 1850–Present Staff
This course explores the emergence of global health from the 1851 International Sanitary Conference in Paris to contemporary global health and examines how health initiatives and policies have evolved over the last 150 years. We begin by examining the impact of colonialism on health systems, highlighting the introduction of Western medicine that dismantled local health systems and established healthcare infrastructures that primarily served colonial and elite interests. We then explore the rise of international health organizations, such as the Rockefeller Foundation, the League of Nations Health Organization (LNHO), and the World Health Organization (WHO), and the role of multilateral institutions in shaping global and local health policy in the postwar period. We also evaluate health missions between the Socialist bloc and the Third World and assess the successes and limitations of these alternative visions for promoting health equity. Over the course of the semester, we examine the experiences of health interventions and eradication programs from the perspective of recipient communities and gain an understanding of resistance, contestations, and adoption of these programs. Challenging dominant narratives that portray recipients of global health projects as passive, we evaluate how marginalized communities have

variously resisted, appropriated, and shaped global technologies and ideas. Importantly, rather than following a linear North (donor) -to-South (recipient) model, we examine how the contemporary global health landscape emerged as the result of the exchange of ideas, technologies, and local knowledge and expertise between the Global North and South HU 0 Course cr

HIST 1765b / EVST 2090b / HSHM 2090b, Making Climate Knowledge Deborah Coen

This is a course about *how* humans have come to know what we know about our impacts on the earth's climate and our vulnerability to climate change. When did humans first *know* that their actions, in the aggregate, could transform the planet? Did scientists bear responsibility to warn of these consequences? In what ways has the modern science of climate both appropriated and undermined traditional and indigenous forms of climate knowledge? Students learn to work with the methods of history of science: we analyze science as a social and material process bound to the cultural and epistemological particularities of its historical context, and we examine the political dimensions of historical narratives about the emergence of the theory of global warming. Via hands-on experience with Yale's historical collections, students learn to analyze maps, artifacts, and instruments as historical sources. They also gain familiarity with the methods of environmental history, learning to attend to historical evidence of shifting relationships between humans and non-humans. Finally, students become more attuned to the evidence of climate change around them and more confident in their ability to make climate knowledge for themselves. HU

HIST 1766a / ECON 2265a, History of Economic Thought Robert Dimand

The objective of this course is to give an overview of how economic analysis has developed, and an introduction to the varied ways in which some of the great economists of the past have gone about studying how the economy functions. We discuss the relevance of their theories to public policy and the role of the state, and consider the roles of pre-analytic vision, improvements in analytical technique, and external events (such as the Great Depression or Global Financial Crisis) in the development of economic analysis. Prerequisites: ECON 115 and ECON 116. SO

HIST 2113b, The Un-American Century Beverly Gage

This course explores the political history of the United States in the 20th century through the national contest over communism and anticommunism, a conflict that reshaped American politics and society at every level. Through this subject, the course investigates debates about democracy and extremism, policing and surveillance, civil liberties and civil rights, liberalism, radicalism, and conservatism, foreign and domestic policy. It describes the evolving histories of both the Left and the Right, along with the ways that government institutions responded to their challenges. Subjects include McCarthyism, the civil rights movement, intellectual history, labor, espionage and security, gender and sexuality, and the Cold War. WR, HU 0 Course cr

* **HIST 2114a / AMST 4449a / FILM 4470a, The Historical Documentary** Charles Musser

This course looks at the historical documentary as a method for carrying out historical work in the public humanities. It investigates the evolving discourse sand resonances within such topics as the Vietnam War, the Holocaust and African American history.

It is concerned with their relationship of documentary to traditional scholarly written histories as well as the history of the genre and what is often called the "archival turn."

HIST 2140a / AMST 1109a / WGSS 1109a, US LGBTQ History & Queer Futures Staff
This interdisciplinary course offers a critical overview of queer history in the United States from the colonial era to the present, exploring the lives and experiences of LGBTQ individuals and emphasizing the broader historical evolution of ideas about sex, sexuality, and gender that constitute the ever-changing landscape of queer history. Through an intersectional lens, students analyze how gender, sexuality, race, and class have shaped LGBTQ identities, cultures, and political movements. Drawing heavily from primary sources including historical texts, literature, visual culture, and popular media, we investigate how queer lives and experiences have been represented, constructed, and contested across time. HU o Course cr

HIST 2149a / AMST 1142a, Early American Studies for 21st-Century America Staff
This introductory lecture offers students a scholarly initiation into the field of early American studies while also reflecting on the increasingly loud politicization of "early American history" as a scholarly and rhetorical project. From Hannah Nikole Jones' 1619 Project to the first Trump administration's 1776 Commission, from the "originalism" or some members of the United States judiciary to the neo-monarchism of so-called "dark enlightenment" thinkers (the Enlightenment itself also being an eighteenth-century movement, if a relatively small one), the politics of our present moment regularly invoke early American history to ground and legitimate their ethical, political, historical, and visionary claims. While this course is primarily an introduction to early American studies—an interdisciplinary approach to the study of the period that draws on scholarship in history, literature, and law, among other fields— the course is organized into three sections, organized around three themes (sovereignty, labor, and governance), and at the end of each section we engage twenty-first century political debates surrounding these themes. This course focuses on British colonial North America, and then the early national United States before 1865, but readings cluster around the long eighteenth century. Topics may include the histories, geographies and politics of Native nations prior to the incursion of Europeans into the region; the labor cultures of bondage (chattel slavery) and indenture; anti-government, anti-monarchical and revolutionary movements; the legal architecture of Native dispossession; the beginnings of nationalist imperialism; the politics of democratic governance; regional, religion-based, and culturally-specific formations of gendered and sexual comportment; visual and/or literary arts of the era; abolitionist movements (temperance, anti-slavery); the creation of citizenship infrastructures as well as those controlling immigration and naturalization; and contemporary visions of what "Americanness" meant, looked like, or represented. HU o Course cr

* **HIST 2196a / AMST 2233a / ER&M 3536a / WGSS 2235a, Another "Other"—Introducing Critical Theories and Histories of Disability** Jiya Pandya
What is disability? How has its definition changed over time? How do people "become" disabled and how does one inhabit a disabled body? In what ways has the disabled body become a site for enacting imperial, national, and resistant politics? Where and how are alternate, radical visions of health being developed? This introductory course in Disability Studies poses answers to these and other related questions through an overview of key texts and debates in the growing

field of disability studies. Students will learn about the transnational history of disability and disability rights, think about the intersections of disability, race, sexuality, gender, and citizenship, and engage with questions of accessibility and activism that already exist in spaces around you. This course, composed of three modules on "disability," "disidentifications" with disability, and "disability justice" and "health liberation," is meant to be both an academic overview of a field and a toolkit for advocacy. As we reckon with the longer impacts of COVID-19 and process what it means to live life during and after a global pandemic, it makes most sense for us to turn to those who have reckoned with what it means to live in "crisis," to inhabit a body that is almost-always at "risk," and to build creative forms of care and community. We will spend significant time with disabled writers, artists, and scholars who offer insight and memory about interactions with and between medicine, war, design, technology, sexuality, race, and imperialism. none

HIST 2211b, The Birth of Europe, 1000–1500 Hussein Fancy
Europe during the central and late Middle Ages, from the feudal revolution to the age of discoveries. Europe as it came to be defined in terms of national states and international empires. The rise and decline of papal power, church reform movements, the Crusades, contacts with Asia, the commercial revolution, and the culture of chivalry. HU 0 Course cr

HIST 2214a, The Early Middle Ages Staff
This course focuses on the "Early Middle Ages" in the Mediterranean, European, and Middle Eastern worlds. This course takes us through a number of events that have long been considered great ruptures: the Fall of the Roman Empire in the West and growth of Barbarian Europe, the collapse of the Persian Empire and Rise of Islam, and the Christianization of the Roman world and dominance of Abrahamic religions in the Mediterranean and Middle East. We consider in what way these phenomena served as historical ruptures, and in what other ways we see continuities threaded across the centuries and across diverse locales. At the same time, we learn how vibrant this world was, where political configurations changed and developed, intellectuals battled with essential questions about the nature of God, and the fundaments of the modern world were laid. We consider these subjects and many more in considering both the creative and diverse medieval world, and the ways in which scholars conceptualize its different aspects. HU 0 Course cr

HIST 2249a / JDST 3446a, Making European Culture Jewish: Five Media, 1780–1930 Staff
This course studies the ways in which Jewish writers and artists turned European culture into Jewish culture, that is, how a minority group fashioned its own version of the majority culture. As European Jews encountered European culture and society, they had to grapple with a host of fundamental questions. What was Judaism and who were the Jews: a religion, a history, a culture, a nation? We examine the way in which writers and artists struggled with these issues in five media: memoir, theology, history, fiction, and painting, thereby creating Jewish versions first of Enlightenment, Romanticism, and realism (1780–1870) and then of nationalism, positivism, and modernism (1870–1930). WR, HU 0 Course cr

* **HIST 2391a / AFST 3385a / EP&E 4350a / HIST 3344a / PLSC 3439a, Pandemics in Africa: From the Spanish Influenza to Covid-19** Jonny Steinberg
The overarching aim of the course is to understand the unfolding Covid-19 pandemic in Africa in the context of a century of pandemics, their political and administrative management, the responses of ordinary people, and the lasting changes they wrought. The first eight meetings examine some of the best social science-literature on 20th-century African pandemics before Covid-19. From the Spanish Influenza to cholera to AIDS, to the misdiagnosis of yaws as syphilis, and tuberculosis as hereditary, the social-science literature can be assembled to ask a host of vital questions in political theory: on the limits of coercion, on the connection between political power and scientific expertise, between pandemic disease and political legitimacy, and pervasively, across all modern African epidemics, between infection and the politics of race. The remaining four meetings look at Covid-19. We chronicle the evolving responses of policymakers, scholars, religious leaders, opposition figures, and, to the extent that we can, ordinary people. The idea is to assemble sufficient information to facilitate a real-time study of thinking and deciding in times of radical uncertainty and to examine, too, the consequences of decisions on the course of events. There are of course so many moving parts: health systems, international political economy, finance, policing, and more. We also bring guests into the classroom, among them frontline actors in the current pandemic as well as veterans of previous pandemics well placed to share provisional comparative thinking. This last dimension is especially emphasized: the current period, studied in the light of a century of epidemic disease, affording us the opportunity to see path dependencies and novelties, the old and the new. SO

* **HIST 2443a / EAST 4301a, Environmental History of Japan (1600 to the present)** Staff
This course explores Japanese concepts of nature and the environment from the Tokugawa period to the present. Split into three modules, we consider how the Japanese government and society have responded to environmental change, degradation, and destruction. The first module—Tokugawa Nature (1600–1868)—examines shifts in agriculture and forestry, urbanization, and the emergence of scholarly knowledge of the natural world. The second module—Modern Transformation (1868–1945)—focuses on Japan's rapid industrialization, disaster preparedness, and imperial expansion, tracing the environmental consequences of these processes on both the archipelago and East Asia. The third module—Postwar Developmentalism (1946–present)—addresses industrial pollution diseases, the Fukushima nuclear disaster, and the environmental struggles related to the American military bases in Okinawa. HU

* **HIST 2464a / EAST 4322a, Law and Society in East Asia, 1600–Present** George Remisovsky
What have been the primary concerns of lawmakers in China, Japan, and Korea throughout history? Were their ideas primarily shaped by "Confucian" ideas or by other, more material concerns? How did the public try to make the legal system work for them? This seminar explores these questions in three parts. Part I examines the structure of the Tang legal system and how it shaped the institutions of both Japan and Korea. Part II focuses on case studies from the seventeenth through nineteenth centuries, showing how these legal systems operated in areas ranging from land disputes to violent acts of revenge. Part III then looks at some of the dramatic changes

that began in the late 19th century, as foreign imperial pressure impelled their transition to Western-style laws and court systems. HU

* **HIST 26621a / RLST 2930a, The Sharīʿa 101: From Medieval Jurists to Modern States, Why Islamic Law Matters Today** Matthew Steele

This course aims to provide students with an alternative reading of the Islamic legal tradition. It upends the view that Islamic law was in some way allergic to change. Likewise, it problematizes the notion that the medieval legal tradition either lacked innovation or was rendered obsolete by colonial reforms and modernist critique. It approaches Islamic law through the speculative enterprise of jurisprudence (*fiqh*), the work of legal scholars to elaborate God's most likely position regarding any legal dilemma. Through the literature and opinions (*fatwās*) of legal specialists from the ninth through the twentieth century, the class interrogates the relationship between change and continuity in Islamic law. We explore how jurisconsults balanced the doctrine of trans-regional schools of law with the local dilemmas faced by the communities in which they lived and served. Similarly, we consider not only the opportunities but also the risks that arise from adapting Islamic law to local conditions. The course challenges students to ask what is change within a tradition? In the debates and polemics of legal scholars, we contemplate the appeal and the limitations of reform within Islamic law, tracing how both have been contested and have evolved across different geographies and periods in the Muslim World. Likewise, we rethink the boundaries of continuity. We question how a legal school and a legal canon are constructed and revised, examining the ways in which both are capable of reinforcing —or imperiling—the Islamic legal tradition. Last, we explore the endurance of Islamic law in contemporary Muslim societies. The course reflects on the processes and the consequences of various projects of "modernizing" the Sharīʿa, asking how the institutions of the colonial and postcolonial state have reconfigured Islamic law in radically different ways. HU

HIST 2623a / GLBL 2357a, Palestine and Israel Laura Robson

This course traces the history of Palestine and Israel from the mid-nineteenth century to the present, focusing particularly on the genesis of the Arab-Israeli conflict and the construction of two opposing nationalist narratives attached to the same geographical space. In this class, we examine the political, social, economic, and cultural history of the region and trace the concurrent development of Palestinian and Israeli national identities during the nineteenth and twentieth centuries. We also consider the historiography of the conflict and investigate some of the most prominent scholarly debates surrounding the history of the region. HU

* **HIST 2635b / HUMS 2035b, Antisemitism and its opponents in the Muslim world** Staff

Antisemitism, as well as opposition to it, has long been a part of social, political, and intellectual life in Muslim-majority societies. These societies have also long included significant Jewish minorities, especially before the foundation of the State of Israel in 1948. This course takes a historical approach, carefully examining antisemitisms of various types in various periods as well as opposition to them by Jews, Muslims, and others in the Islamicate world. HU

* **HIST 2705b / ENGL 3474b / HUMS 1740b, Writing from the Archive: Imagining the Real** Adina Hoffman

Where do the dry, who-what-which details set down on a census form meet the far messier and richer reality of the people whose names are scrawled there? And how might a writer bring that meeting about? What can a shoebox of doodle-filled letters tell us about the ways that friendship, art, war, sex, and politics struck a couple of New York novelists, c. 1941? How do we respond as writers and as a culture when faced with the lack of such inky particulars? Blending seminar and workshop, this class is meant for students who want to write literary non-fiction based on archival materials. In an intensive, hands-on fashion, we'll dig into documents of all sorts as we read essays and excerpts from belletristic works that wrestle with the sometimes slippery fact of the archive. Throughout, we'll ask how best to bring vital prose into being. Weekly writing experiments that draw from various Yale collections and beyond will encourage students to see and respond to archival discoveries freshly and for themselves. A semester-long writing project will take shape as an extension of that seeing and responding. While no previous archival experience is required, this class calls for a serious commitment to the written word. By permission of instructor. Limit 12. WR, HU

* **HIST 3118b, U.S. Immigration Policy: History, Politics, and Activism, 1607–Present** Brendan Shanahan

How can we study a history so broad, complex, and evolving as the history of American immigration policy? This course explores that question by studying U.S. immigration law, politics, and activism from the colonial era to the present day. Chronologically, we particularly examine: (1) antebellum immigration policy in the context of forced migration, settler colonialism, and slavery, (2) the rise of a federal "gatekeeping" immigration regime in the post-Civil War era, and (3) transformations in immigration policymaking and policies during the long twentieth century. Thematically, we emphasize how U.S. immigration policies have often been framed—and challenged by immigrant rights advocates—on the grounds of racialized and gendered exclusion and/or subordination. WR, HU

* **HIST 3119b / AMST 4453b, The United States Constitution of 1787** Mark Peterson

This undergraduate seminar is organized around developing a deep historical understanding of one of our most important documents, the United States Constitution, as it emerged in the late 1780s. In addition to close reading and analysis of this fundamental text, we read a series of other primary sources relevant to the evolution of constitutional thought and practice in the Anglo-American tradition of the early modern period. And we engage relevant secondary scholarship produced by professional historians over the past century or more, in an effort to grapple with the evolution of changing approaches to the Constitution and its meaning over time. This course carries PI credit in History. WR, HU

* **HIST 3126b, Witchcraft in Colonial America** Rebecca Tannenbaum

This class examines the social, religious, economic, and gender history of British North America as it manifested itself through witchcraft beliefs and trials. We also explore the portrayal of the trials in literature and the continuing resonance of witchcraft in modern American culture. WR, HU

* **HIST 3130a / AMST 4441a / ER&M 3570a, Indians and the Spanish Borderlands** Ned Blackhawk
The experiences of Native Americans during centuries of relations with North America's first imperial power, Spain. The history and long-term legacies of Spanish colonialism from Florida to California. WR, HU

* **HIST 3131b / ER&M 1691, Urban History in the United States, 1870 to the Present** Jennifer Klein
The history of work, leisure, consumption, and housing in American cities. Topics include immigration, formation and re-formation of ethnic communities, the segregation of cities along the lines of class and race, labor organizing, the impact of federal policy, the growth of suburbs, the War on Poverty and Reaganism, and post-Katrina New Orleans. WR, HU

* **HIST 3135a, The Age of Hamilton and Jefferson** Joanne Freeman
The culture and politics of the revolutionary and early national periods of American history, using the lives, ideas, and writings of Thomas Jefferson and Alexander Hamilton as a starting point. Topics include partisan conflict, political culture, nation building, the American character, and domestic life. WR, HU

* **HIST 3139b / HSHM 4450b, Fetal Histories: Pregnancy, Life, and Personhood in the American Cultural Imagination** Megann Licskai
In our twenty-first-century historical moment, the fetus is a powerful political and cultural symbol. One's fetal politics likely predicts a lot about how they live their life, vote, worship, and even about how they understand themselves. How, then, has the fetus come to carry the cultural significance that it does? Are there other ways one might think of the fetus? And what is happening in the background when we center the fetus up front? This course examines the many cultural meanings of the fetus in American life: from a clump of cells, to a beloved family member, to political litmus test, and considers the way that these different meanings are connected to questions of human and civil rights, gender relations, bodily autonomy, and political life. We look at the history of our very idea of the fetus and consider how we got here. Each of us may have a different idea of what the fetus is, but every one of those ideas has a particular history. We work to understand those histories, their contexts, and their possible implications for the future of American political life. WR, HU

* **HIST 3145a / AFAM 3145a, Enslavement in the Americas, 1500–1900** Edward Rugemer
This course explores the practice of enslavement in the Americas from the beginnings of colonization through the nineteenth century. The racialized slavery that emerged in the Americas was new to World History, developed by European colonists to exploit the natural resources of the Americas. Initially, European colonists enslaved indigenous peoples wherever possible, yet by the late sixteenth century the enslavement of Africans had become far more common. We focus upon North American and the Caribbean, where European colonists developed sophisticated agricultural enterprises that produced for export to the European market and were completely dependent upon the enslaved labor of Africans. An enormous ocean commerce trafficked almost twelve million enslaved captives from the Atlantic coasts of Africa to work on the plantations of the Americas. The commerce in tobacco, sugar, rum, and cotton enabled these colonies to develop. Black people resisted enslavement at multiple levels, and throughout the

Americas there emerged the Black cultures, languages, musics, struggles, and histories that we know and love today. WR, HU

* **HIST 3150a or b / HSHM 4060a or b, Healthcare for the Urban Underserved** Sakena Abedin

Exploration of the institutions, movements, and policies that have attempted to provide healthcare for the urban underserved in America from the late nineteenth century to the present, with emphasis on the ideas (about health, cities, neighborhoods, poverty, race, gender, difference, etc) that shaped them. Topics include hospitals, health centers, public health programs, the medical civil rights movement, the women's health movement, and national healthcare policies such as Medicare and Medicaid. WR, HU

* **HIST 3158b, When the Rust Hit the Sunbelt: Neoliberalism in the U.S.-Mexico Borderlands** Staff

This seminar examines how macroeconomic forces—including free-trade, deindustrialization, the deregulation of the U.S. economy—along with immigration reform have transformed the U.S-Mexico Borderlands and reshaped the daily lives of its inhabitants. With a focus on how late global capitalism has produced a precarious working class, largely composed of migrant workers, the course guides students in considering how the U.S.-Mexico Borderlands, as a geopolitical, economic, and ideological space of convergence, evolved during the latter twentieth century. By challenging the conventional view of neoliberalism as a unidirectional export from the Global North, the course highlights the multifaceted ways neoliberal policies took root across governmental regimes. Students analyze how individuals in the Borderlands have adapted to and resisted these shifts, while forging communities and livelihoods in the face of growing inequality. WR, HU

* **HIST 3159a, From the Monroe Doctrine to Revolutions: US-Latin America Relations Since 1800** Staff

Since the Spanish American War of 1898, US expansion overseas has shaped the political development of other nations. Nowhere is this more salient than in Latin America, a region with geographic proximity to the United States. This seminar explores the relations between the United States and Latin America, from the rise of nation states in the nineteenth century to present-day conflicts, providing an overview of the most relevant issues that shaped the history of both regions, emphasizing themes like capitalism, imperialism, and resistance. The course shows how key Latin American actors, institutions, and resources shaped the development of the United States as the dominant hegemonic power in the twentieth century. We begin in the nineteenth century, when both regions began to create alliances to combat the presence of European powers in the hemisphere. Then, we examine how US economic and military presence in Latin America was both welcomed and contested by different social sectors in both regions. We also emphasize how the Cold War dictated US strategy in the region, resulting in coups and revolutions, and how Latin America played a fundamental role in US foreign policy. This seminar exposes students to different historiographical debates about American imperialism, tracing how different scholars have characterized the unique relationship between the US and Latin America. WR, HU

* **HIST 3163a, Slavery & Capitalism** Caleb Knapp

This course considers the historical relation between capitalism and slavery in the Americas. It tracks the rise of the slave trade and the plantation economy alongside

emergent processes of primitive accumulation, commodification, labor exploitation, industrialization, social reproduction, and more. Of central concern to the course are historiographical debates about the role that slavery played in the development of capitalist modernity. WR, HU

* **HIST 3164a, Foxes, Hedgehogs, and History** John Gaddis
Application of Isaiah Berlin's distinction between foxes and hedgehogs to selected historical case studies extending from the classical age through the recent past. WR, HU

* **HIST 3165b, Yale and America: Selected Topics in Social and Cultural History** Jay Gitlin
Relations between Yale and Yale people—from Ezra Stiles and Noah Webster to Cole Porter, Henry Roe Cloud, and Maya Lin—and American society and culture. Elihu Yale and the global eighteenth century; Benjamin Silliman and the emergence of American science; Walter Camp, Dink Stover, and the all-American boy; Henry Luce and the information age; faith and ideology in postwar Yale and America. WR, HU

* **HIST 3166b / AMST 4409b / WGSS 4409b, Asian American Women and Gender, 1830 to the Present** Mary Lui
Asian American women as key historical actors. Gender analysis is used to reexamine themes in Asian American history: immigration, labor, community, cultural representations, political organizing, sexuality, and marriage and family life. WR, HU

* **HIST 3168b, Quebec and Canada from 1791 to the Present** Jay Gitlin
The history of Quebec and its place within Canada from the Constitutional Act of 1791 to the present. Topics include the Rebellion of 1837, confederation, the Riel Affair, industrialization and emigration to New England, French-Canadian nationalism and culture from Abbé Groulx to the Parti Québécois and Céline Dion, and the politics of language. Readings include plays by Michel Tremblay and Antonine Maillet in translation. WR, HU

* **HIST 3170a / HSHM 4090a, Community Histories: Reproductive Health in New Haven** Megann Licskai
How does a local focus help us to understand the history of reproductive health, and how does reproductive health help us to understand local history? As a project within Yale's Community Histories Lab, students join a team of Yale researchers and community partners committed to producing new knowledge about the history of health in New Haven. Students collaboratively build an archive of reproductive health histories in New Haven. This archive will be a site of academic interest, developed in response to community needs as we consider how to leverage historical research to imagine a better future. The first unit provides students with targeted methodological training in oral historical and traditional archival methods in preparation of the collection of oral histories and compilation of paper archives. The remainder of the seminar engages these methods in project work. Students use their training to build a publicly accessible reproductive health archive housed at Yale, to develop their own research questions coming out of this nascent archive, and to support New Haven organizations that can use these histories to serve their communities. WR, HU
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* **HIST 3174a / HSHM 4280a, Technology and American Medicine** Deborah Streahle
This course explores the material culture of American medicine. From instruments like thermometers and scalpels to imaging tools like X-rays and MRIs to everyday aids like glasses, prosthetics and fitness tracking apps—technology suffuses medicine today. In this course, we analyze particular technologies as both physical and cultural objects in historical context. In addition to investigating the definition of medical technology, also consider a range of themes and questions, among them: why do some technologies succeed and others fail? What is the relationship between medical technology and power? How do race, class, gender, and sexuality impact the creation and use of medical technology? We pay particular attention to the themes of expertise, authority, and identity. In addition to reading primary and secondary sources, students work closely with materials from the Medical Historical Library. Students can expect to emerge from the course prepared to analyze medical technologies and place them in historical context in American medicine. The course culminates in a student-run virtual exhibition of medical technologies WR, HU

* **HIST 3175a / HSHM 4230a, Healing Spaces in U.S. History** Deborah Streahle
Where does healing happen? Is place an important factor in health care? How has the design of a space influenced health? What is the relationship between nature and health? Students in this course investigate healing spaces in the history of American medicine and consider how space has been understood to interact with health. We discuss health care in institutions, mobile settings, and natural spaces. From ambulances and hospitals to homes and gardens, we consider the impact of setting on patients and practitioners. The course draws on resources local to New Haven as well as guest speakers. Students can expect to emerge from the course familiar with several healing spaces in New Haven and with the way space has impacted broader health care. While the course focus on U.S. history, I welcome student contributions addressing healing spaces beyond the U.S. WR, HU

* **HIST 3177a / HSHM 4480a / WGSS 4448a, American Medicine and the Cold War** Naomi Rogers
The social, cultural, and political history of American medicine from 1945 to 1960. The defeat of national health insurance; racism in health care; patient activism; the role of gender in defining medical professionalism and family health; the rise of atomic medicine; McCarthyism in medicine; and the polio vaccine trials and the making of science journalism. WR, HU

* **HIST 3178b / HSHM 4240b, Health Activism in U.S. History** Deborah Streahle
How have activists changed health care? How have health concerns become political? This course explores health activism and advocacy via case studies drawn from U.S. history from 19th-century sanitary reform to 21st-century environmental justice. Throughout the course, students examine movements, figures, and tactics that have shaped health policy and practice. We analyze the role of grassroots organizations, policy advocacy, and public campaigns in shaping health policy and addressing health inequities. Themes include: the intersection of health and social justice; the role of government and policy in health care; the influence of social movements on health reform; and strategies for effective advocacy and activism. Students engage with a variety of primary sources, including historical documents, speeches, art, and personal narratives, and emerges with an ability to analyze health activism in historical context. WR, HU

* **HIST 3179a or b / HSHM 4580a or b, Scientific Instruments & the History of Science** Paola Bertucci
What do scientific instruments from the past tell us about science and its history? This seminar foregrounds historical instruments and technological devices to explore how experimental cultures have changed over time. Each week students focus on a specific instrument from the History of Science and Technology Division of the Peabody Museum: magic lantern, telescope, telegraph, astrolabe, sundial, and more! WR, HU

* **HIST 3186b, Intelligence, Security, & Society in Modern US History** Staff
This course traces the evolution of U.S. intelligence and the national security state, from its 19th-century origins to its post-WWII expansion and through the early War on Terror. Focusing on espionage, covert operations, and surveillance, students examine the rise of intelligence agencies, their internal conflicts, and their complex relationships with government institutions, the private sector, and political interests. Beyond providing a history of security institutions, the course explores how espionage and security practices have shaped American society—its politics, culture, and identity—while also considering how race, gender, sexuality, and class have influenced the practice of intelligence and state-building. At its core, the course investigates how domestic and foreign threats blur, driving a security state shaped by both internal fears and external pressures. WR, HU

* **HIST 3187b, Histories of Sexuality, Gender, and Race in the United States** Staff
This seminar introduces students to the entangled history of sexuality, gender, and race in the United States, from slavery to present. We question how race, gender, and class have shaped the making of sexual knowledges, sexual norms, and sexual identities. Together, we track how the idea of "sexual deviance" has been constructed over time to shore up varying political, economic, scientific, and cultural projects and regulate queer and trans lives. This course presents students with the main questions and frameworks that have animated the history of sexuality. We consider the role of slavery in the colonial sexual economy, the place of family life and homoeroticism in the colonial city, the rise of sexology in the nineteenth century and the emergence of homosexuality and heterosexuality as sexual and social identities, the significance of capitalism, urbanization, and Reconstruction-era race politics in the history of sexuality, and how racialized gender and sexual norms in the twentieth century were shaped by state-building, immigration, medical and psychiatric knowledge, and neoliberal social policy. A previous history course is recommended. WR, HU

HIST 3188b / HSHM 2140b, Extraterrestrials in History Ivano Dal Prete
The notion of extraterrestrials and "radical others" in history and culture from antiquity to the present. Topics include other worlds and their inhabitants in ancient Greece; medieval debates on the plurality of worlds; angels, freaks, native Americans, and other "aliens" of the Renaissance; comet dwellers in puritan New England; Mars as a socialist utopia in the early twentieth century; and visitors from space in American popular culture. HU

* **HIST 3195b / HSHM 4150b, Historical Perspectives on Science and Religion** Ivano Dal Prete
The engagement between science and religion from a historical standpoint and a multicultural perspective. The Islamic, Jewish, Buddhist, and Christian traditions;

the roots of modern creationism; salvation expectations and the rise of modern science and technology. WR, HU

* **HIST 3197a / HSAR 4375a / HSHM 4410a, Museums: Power and Politics** Elaine Ayers

Museums are in a state of crisis. From calls for decolonization and repatriation to protests over human remains collections and unethical donor policies, museums and related cultural institutions find themselves at a crossroads, reckoning with their violent colonial histories while handling ongoing concerns about workers' rights, systemic inequality, and their role in shaping knowledge in the public sphere. Whether addressing climate change policy, Black Lives Matter protests, fights for unionization, or Indigenous representation, it's clear that museums are rich sites for critique in the history of science and beyond. How did we get here, and where do we go from here? Beginning with early modern cabinets of curiosity and moving through nineteenth century encyclopedic museums, controversial anatomical collections, and more recent natural history institutions, we investigate how museum politics and power produce knowledge, from the depths of their archives to sensationalized exhibits while questioning what an ethical, holistic museum might look like in the future. Amidst ongoing debates over controversial collections like the Benin Bronzes, human remains stored in universities across the United States, the Metropolitan Museum of Art's 2023 admission of looting practices, and the American Museum of Natural History's shallow apology for its eugenic past, the role of museums has expanded beyond the bounds of the academy, stoking universal struggles around human rights, international repatriation policies, and the politics of preservation, display, and loss. We bridge the classroom and the collection, visiting institutions around New Haven, practicing skills like provenance research and ethical handling of difficult objects while working towards a practice-based final project that suggests ways forward for museums and collections. WR, HU

* **HIST 3210b / HUMS 4124, Hobbes and Galileo: Materialism and the Emergence of Modernity** William Klein

Hobbes considered himself a disciple of Galileo, but as a systematic philosopher and ideologue during a period of civil unrest in England, he no doubt produced something that Galileo, a Tuscan astrophysicist and impassioned literary critic, was not entirely responsible for: an absolutist theory of the modern state situated within an eschatological time frame. In this course we will reflect on the relation between Galileo's anti-Aristotelian physics and Hobbes' system by reading key texts by Galileo and Hobbes along with an array of interpretations and criticisms of Hobbes that will serve to situate Hobbes in early modern currents of thought in science, religion and politics, while at the same time situating us in contemporary ideological debates about the origins of modernity. HU

* **HIST 3214a, History of the Night** Maria Jordan

This seminar is dedicated to the reality and the perception of the night across time and in different cultures. We explore how religious and philosophical beliefs, political and economic forces, changes in technologies of lighting, human biology, and the shift from rural to urban and agrarian to industrial societies affected attitudes toward time in general and the night in particular. These changes influenced the perceptions, uses, and the ways different groups experienced nocturnal time, and how we act, sleep, work, interact, and even dream. The traditional binary view of day and night is

questioned by presenting a more complex "and dynamic face" of the night. Nightfall provides multiple opportunities for dissent and rebellion and becomes an ideal space for marginal and subordinate people. Historical analysis, literary texts, medical and scientific writings, and primary sources provide the class with a cross-disciplinary approach to examine how the night became the abode of the ghost, the devil, the witch, and the dead, and how the night became criminalized, commercialized and even politicized. In our time, improvements in lighting changed the nocturnal world, but also had detrimental effects on sleep and dreams, and caused contemporary movements–aesthetic and scientific–to "rescue" the night. WR, HU

* **HIST 3216a, History of Food and Cuisine** Paul Freedman
Food as an expression of cultures and societies from pre-history to the present. How environment, taste, and contacts among peoples and actions influence culinary preferences. The second half of the course concentrates on US history and looks at food in relationship to immigration, gender, technology, and ethnicity. WR, HU

* **HIST 3218a, Crossroads of Empire: Ireland, Canada, and 19th-Century Anglo-American Relations** Brendan Shanahan
This seminar examines the role of Ireland, Canada, and Irish (North) Americans in the development of U.S.-U.K. relations and the (geo)politics of Anglo-American empire in the long nineteenth century. It explores the countless examples of fracture, détente, and alternatively competing and collaborative imperial projects that defined Anglo-American relations in the long nineteenth century (prior to rise of rapprochement, alliance, and the eventual "special" U.S.-U.K. relationship of the twentieth century). The course pays special attention to the importance of international relations to the domestic politics of each respective polity and the transnational forms of revolutionary and counterrevolutionary politics that emerged from them. The class primarily engages the fields of (North) American political history, migration history, diplomatic history, comparative empire, and U.S. and the World scholarship. Students also workshop original research methods and makes use of Yale's Library and Archival Collections. WR, HU

* **HIST 3220a, Grand Strategy and the Origins of the Second World War** Paul Kennedy
A survey of the most important literature and debates concerning the coming of the Second World War in both Europe and the Pacific. Emphasis on the comparative approach to international history and on the interplay of domestic politics, economics, and strategy. Counts toward only European distributional credit within the History major. WR, HU RP

* **HIST 3222b / RSEE 222, Russia and the Eurasian Steppe** Paul Bushkovitch
A study of Russia's interaction with the nomads of the Eurasian steppe. Topics include the Mongol invasion, the Mongol Empire in Asia and the Golden Horde, Islam, nomadic society, and the Russian state. Focus on conquest and settlement. May count toward either European or Asian distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU

* **HIST 3226b / JDST 3470 / RLST 2310b, How the West Became Antisemitic: Jews and the Formation of Europe 800–1500** Ivan Marcus
Students study how Jews and Christians interacted on a daily basis as medieval Europe became more restrictive and antisemitic, a contributing factor to the Holocaust. In this

writing seminar, students discuss a variety of primary sources in class—laws, stories, chronicles, images—while researching and writing their own seminar paper structured by sessions on topics, bibliographies, and outlines. WR, HU

* **HIST 3232a / HUMS 4430a / JDST 3270a / MMES 3342a / RLST 2010a, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus
How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

* **HIST 3236a / HUMS 323, Truth and Sedition** William Klein
The truth can set you free, but of course it can also get you into trouble. How do the constraints on the pursuit and expression of "truth" change with the nature of the censoring regime, from the family to the church to the modern nation-state? What causes regimes to protect perceived vulnerabilities in the systems of knowledge they privilege? What happens when conflict between regimes implicates modes of knowing? Are there types of truth that any regime would—or should—find dangerous? What are the possible motives and pathways for self-censorship? We begin with the revolt of the Hebrews against polytheistic Egypt and the Socratic questioning of democracy, and end with various contemporary cases of censorship within and between regimes. We consider these events and texts, and their reverberations and reversals in history, in relation to select analyses of the relations between truth and power, including Hobbes, Locke, Kant, Brecht, Leo Strauss, Foucault, Chomsky, Waldron, Zizek, and Xu Zhongrun. WR, HU

* **HIST 3240a / RSEE 2410a, Government, Law, and Society in Modern Russia, 1853-1953** Sergei Antonov
Russian political culture from the Crimean War to the death of Stalin. Special attention to continuities, as well as changes, across the revolutionary divide of 1917, and to comparing official policies with daily experiences of ordinary Russians. Changing ideologies and ruling styles of tsars and early Soviet leaders (esp. Lenin, Trotsky, and Stalin) and relations with aristocratic and bureaucratic elites; political dissent and protest, including popular and state-imposed violence; the problem of legality and the rule of law. All discussions and readings in English. WR, HU

* **HIST 3242a / CLCV 3691 / HELN 3000a, The Olympic Games, Ancient and Modern** George Syrimis
Introduction to the history of the Olympic Games from antiquity to the present. The mythology of athletic events in ancient Greece and the ritual, political, and social ramifications of the actual competitions. The revival of the modern Olympic movement in 1896, the political investment of the Greek state at the time, and specific games as they illustrate the convergence of athletic cultures and sociopolitical transformations in the twentieth century. HU

* **HIST 3260a / HSHM 4680a, Sex, Life, and Generation** Ivano Dal Prete
Theories and practices of life, sex, and generation in Western civilization. Politics and policies of conception and birth; social control of abortion and infanticide in premodern

societies; theories of life and gender; the changing status of the embryo; the lure of artificial life. WR, HU

* **HIST 3265a / ITAL 3387a / RLST 3145a, Francis of Assisi and His Legacy** Carlos Eire

Francis of Assisi is undoubtedly one of the most important figures in European history. As one of Catholicism's most revered saints (often considered to be the greatest male saint ever), his radical message of voluntary poverty, humility and fraternity significantly revived the Catholic church in a moment of profound crisis, and has since been accepted as one of the foundational elements of European thought, receiving universal admiration from diverse thinkers who are often unaffiliated with the Catholic tradition. This course seeks to take both challenges head on. Its pedagogical intent is three-fold. First, by offering a comprehensive overview of the layered accumulation of narratives that has given us the Francis figure so beloved today, it encourages students to examine the ambiguous boundaries of "reliability" with regard to historical narratives, especially those with a mythopoetic flavor. Other than the well-known "Little Flowers", students are also exposed to less-known "lives" of the saint and are expected to critically compare these sources. Second, students are invited to Socratically wrestle with Francis' spiritual legacy in light of its obvious conflict with prevalent notions of the "good life" in contemporary America. Third, students will gain a robust understanding of the Franciscan tradition which has left its footprint in vast regions outside of Europe (Jerusalem, East Asia, the Americas), has generated an important school of theology, and continues to stoke prominent public debates through controversial modern figures such as Padre Pio. Background readings on medieval religious history will also be provided. Topics will include orthodoxy and heresy, factional conflict within religious orders, missionary activities, mysticism, female religious life, and faith and the visual arts. L4, HU

* **HIST 3269a, History and Holocaust Testimony** Carolyn Dean

This course focuses on Holocaust testimony to ground students in the history of how victims' experiences are narrated and assessed by historians and other interpreters who shape the afterlives of historical events. Class readings underscore how Holocaust memory has changed over time, including how it belatedly became an event primarily about the genocide of European Jewry. We read histories, testimonies, and work on the relationship between the historical memories of the Holocaust and of European Imperialism. WR, HU

* **HIST 3292a / HUMS 2790a / PLSC 3313a, Democracy and the French Revolution** Isaac Nakhimovsky

The French Revolution of 1789 and its legacies, as viewed through the late-eighteenth-century debates about democracy, equality, representative government, and historical change that shaped an enduring agenda for historical and political thought in Europe and around the world. WR, HU

* **HIST 3344a / AFST 3385a / EP&E 4350a / HIST 2391a / PLSC 3439a, Pandemics in Africa: From the Spanish Influenza to Covid-19** Jonny Steinberg

The overarching aim of the course is to understand the unfolding Covid-19 pandemic in Africa in the context of a century of pandemics, their political and administrative management, the responses of ordinary people, and the lasting changes they wrought. The first eight meetings examine some of the best social science-literature on 20th-century African pandemics before Covid-19. From the Spanish Influenza to cholera to

AIDS, to the misdiagnosis of yaws as syphilis, and tuberculosis as hereditary, the social-science literature can be assembled to ask a host of vital questions in political theory: on the limits of coercion, on the connection between political power and scientific expertise, between pandemic disease and political legitimacy, and pervasively, across all modern African epidemics, between infection and the politics of race. The remaining four meetings look at Covid-19. We chronicle the evolving responses of policymakers, scholars, religious leaders, opposition figures, and, to the extent that we can, ordinary people. The idea is to assemble sufficient information to facilitate a real-time study of thinking and deciding in times of radical uncertainty and to examine, too, the consequences of decisions on the course of events. There are of course so many moving parts: health systems, international political economy, finance, policing, and more. We also bring guests into the classroom, among them frontline actors in the current pandemic as well as veterans of previous pandemics well placed to share provisional comparative thinking. This last dimension is especially emphasized: the current period, studied in the light of a century of epidemic disease, affording us the opportunity to see path dependencies and novelties, the old and the new. SO

* **HIST 3364b, Riverscapes in African History** Robert Harms
This junior seminar features case studies that focus on an epoch or episode in Africa's history that was influenced or shaped by the riverine ecosystem in which it was embedded. Chronologically, the case studies range from the Nile in early dynastic ancient Egypt to the discovery of vast peatlands in the Congo River Basin in 2017. Geographically, the course looks at histories that developed in four of Africa's major river basins: the Nile, the Niger, the Congo, and the Zambezi. WR, HU

* **HIST 3388a, Slavery and the Slave Trade in Africa** Robert Harms
The slave trade from the African perspective. Analysis of why slavery developed in Africa and how it operated. The long-term social, political, and economic effects of the Atlantic slave trade. WR, HU

* **HIST 3392a / AFST 392 / ER&M 3547, Pan-Africanism, Anti-Colonialism and Colonial Modernity** Daniel Magaziner
A history of Pan-Africanism and Anti-Colonial thought from the Haitian Revolution until the apex of the global struggle against apartheid and white supremacy in South Africa, focusing on intellectual and cultural history from across the African diaspora and Atlantic world. HU

* **HIST 3415a / HSHM 4740a / SAST 3640a, Health, Medicine and Science in Modern South Asia** Gourav Krishna Nandi
In this seminar, we explore health, medicine, and science in South Asia during the 19th and 20th centuries, and examine how networks and circulations of medical knowledge, local and transnational actors, and anticolonial physicians and scientists shaped colonial modernities and postcolonial nationalism in the region. In the first part, we examine the establishment of colonial medicine in British India, colonial interventions during plague visitations, and approaches to famine and food in the 19th century. We explore how science in colonial India was intertwined with anticolonialism, and examine anticolonial arguments against famines using modern economic sciences. In the second part, we explore pluralist practices of medicine in colonial South Asia and analyze how diverse approaches of colonial Indian medical practitioners blur the categories of "traditional" and "modern" medicine. We then focus on colonial and postcolonial public health interventions—including, regulating poisons and adulterated food,

population control, and vaccination campaigns—and their contestations. In the final part, we focus on the postcolonial state and explore how scientific nationalism shaped the postcolonial state's approaches to modernization and development. We examine how Indian physicists and surgeons created and maintained knowledge networks using alliances on both sides of Cold War rivalries. WR, HU

* **HIST 3419a / WGSS 3419a, Modern South Asian Histories of the Body** Jiya Pandya
Beginning from the recognition that bodies are contextually specific and historically produced, we chart South Asia's history in the 19th, 20th, and 21st centuries from the vantage point of the body. Unpacking the body's role as a site of power in imperial, nationalist, and postcolonial politics, we investigate how our narratives of history deepen when we make questions of race, caste, gender, sexuality, and disability central to our narratives. To understand some of the vast array of embodied practices under empire and in new national states, we consider the perspectives of multi-disciplinary scholars across a series of themes like violence, labor, war, and health. Together, we work to foster ethical engagement with historical subjects and to understand the lasting legacies of embodied histories on the social and political worlds of South Asia today. HU

* **HIST 3463a / ER&M 3633a / SAST 3340a, Mobile South Asians and the Global Legal Order** Rohit De
South Asians make up the largest population of overseas migrants in the world, close to 33 million in 2017 and a diaspora that is almost double that number. This course looks at the unprecedented mobility of South Asians from the mid-19th century until now as merchants, indentured labor, students, pilgrims, professionals, domestic workers, political exiles, refugees, and economic migrants, through the lens of state attempts to control movement and individual resistance, subversion, and adaptation to such controls. Focusing on the legal consciousness of South Asian migrants and the emergence of South Asian nations as political players on the global stage, this class traces how South Asian mobility led to the forging of a new global order, over migration, multiculturalism, Islamic law, civil liberties, labor law, and international law. WR, HU

* **HIST 3703b / HSHM 4730b, Vaccination in Historical Perspective** Jason Schwartz
For over two centuries, vaccination has been a prominent, effective, and at times controversial component of public health activities in the United States and around the world. Despite the novelty of many aspects of contemporary vaccines and vaccination programs, they reflect a rich and often contested history that combines questions of science, medicine, public health, global health, economics, law, and ethics, among other topics. This course examines the history of vaccines and vaccination programs, with a particular focus on the 20th and 21st centuries and on the historical roots of contemporary issues in U.S. and global vaccination policy. Students gain a thorough, historically grounded understanding of the scope and design of vaccination efforts, past and present, and the interconnected social, cultural, and political issues that vaccination has raised throughout its history and continues to raise today. HU

* **HIST 3706b, The Monroe Doctrine at 200 Years: History of the United States and Latin America** Greg Grandin
This seminar focuses on the history of the United States and Spanish, French, and Portuguese America, from the Age of Revolution to the present day. It covers such topics as the American, Haitian, and Spanish-American Revolutions; the

Monroe Doctrine; the Confederacy's foreign policy toward Spanish America, Brazil, and Haiti; William Walker's invasion and occupation of Nicaragua; the end of slavery throughout the Americas, and the New World consolidation of jus soli (or birthright) notions of citizenship; the War of 1898; the building of the Panama Canal; US counterinsurgencies in Haiti, Nicaragua, and the Dominican Republic; the Good Neighbor Policy; the politics and culture of the Cold War, including CIA interventions in Guatemala, Chile, and Nicaragua; and the Invasion of Panama. Combining social, intellectual, and diplomatic history, the course covers topics such as the region's revolutionary wars for independence; comparative republicanisms; the creation of borders; the expansion and abolition of slavery; more revolutions, and counterrevolutions; military interventions and coups; and evolving forms of political economy. The course's main comparative framework is to examine how the United States and Latin America both advanced, and struggled to define, a set of New World ideas and political forms: Christianity, republicanism, liberalism, democracy, sovereignty, rights, and, above all, the very idea of America. WR, HU

* **HIST 3718b / WGSS 2297b, Gender Expression Before Modernity** Igor De Souza
What are the historical forms of gender non-conformity? This course investigates expressions of gender that were considered non-conforming within their historical contexts. Our point of departure is the idea that gender constitutes a "useful category of historical analysis" (Joan Scott). In this course we ask how deviant gender expression can be a category of historical analysis. How do we write history from the perspective of gender fluidity, non-binarism, and gender transgression? How can this history give us the tools to critique regnant norms of gender expression, then and now? How does this historical approach relate to trans* and non-binary people & movements today? The course is historically wide-ranging, from Antiquity to the Early Modern period, and geographically diverse, including Europe, the Middle East, and the colonial Americas. The breath of contexts enable us to consider broad patterns, continuities, and discontinuities. At the same time, we discuss the specificities of particular contexts, emphasizing the connection between gender fluidity/non-conformity, on the one hand, and local cultural norms around gender and sex, on the other. We investigate intellectual and cultural trends, as well as the lives of gender fluid/non-conforming individuals. We analyze sources drawn from law, medicine, religion, philosophy, visual arts & literature, biographies, and memoirs. All readings are in English translation. No prior background is required. However, it will be helpful to have taken either WGSS 291/HIST 287J or WGSS 306 before or in concurrence with this course. HU

* **HIST 3719a / HSHM 4330a / WGSS 4419a, Gender and Science** Deborah Coen
Exploration of the dual potential of the sciences to reinforce received ideas about gender or to challenge existing sexual and racial hierarchies; the rise of the ideas and institutions of the modern sciences as they have reflected and shaped new notions of femininity and masculinity. WR, HU

* **HIST 3741a, Ordering the World: A Twentieth-Century History** Tien Thanh Nguyen
Talks of "world order" abound today. How did we come to think this way, how has it shaped how we act, and to what effects? This seminar introduces students to the field of global history through a study of ideas of world order in the twentieth century. As the Eurocentric world order of the nineteenth century was shattered by global conflicts, competing worldmaking projects arose, prompting intellectuals and social scientists to

race to comprehend them. The identification or declaration of a certain emerging order was often also a political intervention. Thus, to study the trajectory of the world order in the last century, we need a combined toolkit of international history and intellectual history. After surveying the political and intellectual impacts of the world wars, we will pay special attention to the twin processes of Cold War and decolonization, their origins and their aftermath. Through topics such as war and revolution, modernization and development, nationalism and capitalist globalization, students will be equipped to think critically about contemporary questions: Are we entering a new Cold War? Is empire a thing of the past? Can history inform foreign policy? We will also pay attention to world order as intellectually experienced by historical actors, especially experiences of disorder and imaginations of a new world in an eventful century. With travelers, novelists, and social scientists as well as statesmen as our guides, we will dwell on how moments of crisis and rupture such as global wars and violence, imperial dissolution, and the rapid, uneven development of capitalism gave rise to not only new institutional experiments but also new forms of subjectivity and imagination, all of which help make any idea of order plausible. WR, HU

* **HIST 3742a / AMST 2253 / ENGL 2853 / HSHM 4180a / SOCY 3233 / WGSS 4435a, Queer Science** Juno Richards

Why are there so many studies involving trans brain scans? Can facial recognition technology really tell if you're queer? Why is everyone so obsessed with gay penguins? For that matter, how did science come to be the right tool for defining and knowing sex, gender, and sexuality at all? How does that history influence our collective lives in the present, and what are some alternatives? This course gives students a background in the development of sex science, from evolutionary arguments that racialized sexual dimorphism to the contemporary technologies that claim to be able to get at bodily truths that are supposedly more real than identity. It introduces scholarly and political interventions that have attempted to short-circuit the idea that sex is stable and knowable by science, highlighting ways that queer and queering thinkers have challenged the stability of sexual categories. It concludes by asking how to put those interventions into practice when so much of the fight for queer rights, autonomy, and survival has been rooted in categorical recognition by the state, and by considering whether science can be made queer. HU

* **HIST 3744a, Early Photography: Global Tech, Local Histories 1839–1914** Zeinab Azarbadegan

Photos are windows onto known and unknows places; they are an inseparable part of how we see and understand the world. In the age of Instagram, smartphones, and #Filter-#NoFilter we are all photographers, our very own curators of visual microcosms. We produce and consume photographic images almost constantly. We are now simultaneously master, subject, and audience in a transnational consumerist visual culture. This is remarkable seeing as the technology of photography has only been around for the past 180 years. No one could have foreseen the selfie as a potential technological application. The advent of photography in 1839 as a means of visual knowledge production was entangled with the rise of modern disciplines of ordering and categorizing knowledge about both people and places. Going beyond looking at photography merely as a technology invented in and disseminated from Europe, this course attempts to analyze "other histories" of photography, by looking at how this global technology was appropriated locally in Asia, Africa and the Americas. It is

thus a global social history of the technology of photography. This course endeavors to give students the tools to analyze photos contextually, materially, and in terms of their content by looking at the first sixty years of photography. Specifically, this course looks at the intertwined histories of early photography and the formulation of modern disciplines by focusing on how early non-European anthropologists, geographers, and archaeologists incorporated photography in their methods of picturing place and the populace. Through thematic analysis and examination of different types of archival photos, students learn how to analyze photos both in the larger context of other visual sources, such as paintings, as well as textual sources.
WR, HU

* **HIST 3747b / HIST 447J / HSHM 4670b / WGSS 4465b, History of the Body** Ziv Eisenberg
What does it mean to have a "bad hair day?" How should you care for your skin? What happens when you eat a burger and drink wine? How are babies made? What happens when you die? The answers depend not only on who provides them, but also on where and when. This seminar examines historical production of systems of corporeal knowledge and power, as well as the norms, practices, meanings, and power structures they have created, displaced, and maintained. Structured thematically, the course familiarizes students with major topics in the history of the body, health, and medicine, with a particular focus on US history. WR, HU

* **HIST 3750b / HSHM 4440b, Health, Humanitarianism, and Refugee Politics** Gourav Krishna Nandi
How have states historically determined which bodies deserve asylum and care and which can be exposed to deportation, detention, and violence? How have colonial depictions of Asia and Africa as racialized geographies continued to shape migration policies and humanitarian practices throughout the twentieth century? In this seminar, we explore how states and humanitarian actors have utilized technologies of surveillance and control to govern the lives and movements of migrants and refugees throughout the twentieth century. We consider the multifarious reasons why communities, especially throughout Asia, have been mobile since the beginning of the nineteenth century and how this mobility has been shaped through colonial biomedical regimes. Critically interrogating Western images of Global South refugees seeking asylum in the Global North, we investigate contemporary gendered and racialized images of the "good refugee" or migrant who "deserve" consideration in the modern humanitarian system through biomedical categories. Students are expected to apply historical insights to contemporary debates surrounding surveillance, citizenship, and the global migration regime, challenging prevailing narratives and exploring alternative perspectives on refugee surveillance regimes. WR, HU

* **HIST 3761a / HSHM 4380a, Unnatural History: Colonialism and Inequality in the Making of Nature** Elaine Ayers
Penetrated jungles, "mother" nature, and quests to preserve the redwoods—for hundreds of years, colonial agents have characterized environments in racialized, gendered, sexualized, classist, and ableist terms, anthropomorphizing nature along ongoing systems of inequality. This class traces shifting conceptualizations of nature from the early modern period to the present, focusing on how naturalists and scientists have described, collected, and displayed "new" environments and peoples while building extractive and exploitative natural history collections, from

cabinets of curiosity to Yale's own Peabody Museum. By analyzing methodologies like classification, conservation, and scientific communication, we will discuss how divisions between the "natural" and "unnatural" were created in western cultures along unequal ideas about human bodies. Critical analyses of sources across multiple disciplines will inform conversations about knowledge production with the goal of interrogating how these power structures have silenced voices and enacted long-lasting violences on both environments and the peoples inhabiting them. Using both primary and secondary sources while conducting original research, students will learn how binary and reductive categories have been used and abused in colonial science and beyond. This class will include visits to museums around Yale's campus and beyond, with two of your assignments focused on the Peabody Museum. WR, HU

* **HIST 3768a / JDST 3451a / PLSC 3464a / RLST 3240a, The Global Right: From the French Revolution to the American Insurrection** Elli Stern

This seminar explores the history of right-wing political thought from the late eighteenth century to the present, with an emphasis on the role played by religious and pagan traditions. This course seeks to answer the question, what constitutes the right? What are the central philosophical, religious, and pagan, principles of those groups associated with this designation? How have the core ideas of the right changed over time? We do this by examining primary tracts written by theologians, political philosophers, and social theorists as well as secondary literature written by scholars interrogating movements associated with the right in America, Europe, Middle East and Asia. Though touching on specific national political parties, institutions, and think tanks, its focus is on mapping the intellectual overlap and differences between various right-wing ideologies. While the course is limited to the modern period, it adopts a global perspective to better understand the full scope of right-wing politics. HU, SO

* **HIST 3770b, The Arabic Atlantic** Alan Mikhail

This course begins with advent of colonialism in the Americas in order to rethink the ways in which race and religion comingled in histories of conquest, genocide, and slavery that bridge, but also to sort through the differences between the Atlantic, Caribbean and Mediterranean worlds. The course examines and conceptualizes how the Middle East *figured* in European imperial projects in the Western Hemisphere. It starts with the Papal sanction of Spanish and Portuguese colonial projects in the Americas as a continuation of their expulsion of the Moors from Iberia and proceeds to examine the histories of enslaved Black Muslims. A visit to the Beinecke Library and the Yale Archives to examine Ezra Stiles' collection of Hebrew and Arabic texts and the 'moorish' identity of the boy he enslaved brings our inquiry closer to home. Additional visits to the archives of American missionary societies active in the Middle East, which are housed at the Yale Divinity School, invites students to examine primary sources linking Yale and New Haven to the Middle East. Our class ends in 1887 with Frederick Douglass' visit to Egypt and the concurrent histories of officers in the US Confederacy who served in the Egyptian military. By examining how the Middle East came to appear in European imperial projects in the Americas, we can more critically understand how American and European colonizers, missionaries, and travelers came to appear in the Middle East. Topics include toleration and violence, women and gender, settler colonialism, slavery, ecological and climatic changes, and the birth of financial capitalism. The study of the Mediterranean, Caribbean, and the Americas. WR, HU

* **HIST 3771b, Women Who Ruled** Winston Hill
The range of the course is broad. We're going to go all the way from ancient Egypt to the present day, and around the world once or twice. As we do that, you get familiar with queens from Wu Zetian to Njinga of Angola to Elizabeth II, and gain some understanding of just how massive the sweep of history is. In the course, we try to answer two key historical questions: What parts of these queens' lives and experiences are made different by the particular conditions of their societies and cultures? Do gender, race, and power interact in similar ways across time and space? By the end of the course, we should have some answers. We also closely consider the question of this history's relevance today. What roles do the stories of these politically powerful women play in our present, and in the presents of cultures across the globe? And how can we learn to be critically literate consumers of history in pop culture? WR, HU

* **HIST 3783a / GLBL 3344a / PLSC 3125a, Studies in Grand Strategy II** Michael Brenes
The study of grand strategy, of how individuals and groups can accomplish large ends with limited means. During the fall term, students put into action the ideas studied in the spring term by applying concepts of grand strategy to present day issues. Admission is by application only; the cycle for the current year is closed. This course does not fulfill the history seminar requirement, but may count toward geographical distributional credit within the History major for any region studied, upon application to the director of undergraduate studies. Prerequisite: PLSC 321. Previous study courses in political science, history, global affairs, or subjects with broad interdisciplinary relevance encouraged. SO o Course cr

* **HIST 3784b, Histories of Capitalism in Modern Asia** Sunil Amrith
The economic rise of Asia—and especially of China and India—has coincided with a resurgence in historical research on the concept of "capitalism." Over the past twenty years, historians of capitalism have situated the origins of capitalist transformation in global forces and processes. Yet this body of scholarship has largely focused on North America, Western Europe, and the Atlantic world. This seminar aims to elucidate how an integration of modern Asian history into global histories of capitalism might challenge existing historical models of economic life. How are we to understand the relationship of Asia—and different regions within Asia—to capitalism? Is capitalism a long-term tendency in the societies of early modern Asia, or is it a set of external arrangements superimposed upon local settings? What is the relationship between capitalism and the social organization of South, Southeast, and East Asian societies? This seminar anchors these questions in two main areas of focus: the role of environmental variables in histories of capitalism in Asia; and the centrality of migration in networks of labor, commerce and specialization. We will explore these questions through a series of topics including: the pre-colonial trading world of the Indian Ocean; arguments about industrialization and the "Great Divergence" in the nineteenth century; continuities and transformations under colonialism; nationalism, decolonization, and competing visions for developmentalism; as well as neoliberalism and the energy transition. HU

* **HIST 3797a, Global Capitalism since 1800: Origins, Alternatives, Futures** Staff
From the ads on our computers and the oil in our cars to university endowments and the clothes that we wear, capitalism seems to touch every aspect of modern life. But what exactly is this force that seems so universal? How has it changed across time

and space? This reading—and writing—intensive course surveys the global history of capitalism since the end of the eighteenth century, covering both the details of economic change and its interaction with society, culture, and politics. Students learn how capitalism has changed from the cotton mills of the nineteenth century to the cryptocurrency exchanges of the twenty-first; how its effects have been felt and interpreted in different ways around the world; and how historians employ a range of methodological approaches and sources to make sense of this history. Key themes include economic ideas; technological change; the tension between global interconnection and everyday life; and how both critics and champions have understood capitalism's relationship to social justice and personal freedom. No prior subject knowledge is necessary, though some experience with history courses is helpful. WR, HU

* **HIST 4994a, Individual Writing Tutorial** Daniel Magaziner
For students who wish, under the supervision of a member of the faculty, to investigate an area of history not covered by regular departmental offerings. The course may be used for research or for directed reading. It is normally taken only once. The emphasis of the tutorial is on writing a long essay or several short ones. To apply for admission, a student should present the following materials to the director of undergraduate studies on the Friday before schedules are due: a prospectus of the work proposed, a bibliography, and a letter of support from a member of the History department faculty who will direct the tutorial. A form to simplify this process is available from the office of the director of undergraduate studies.

* **HIST 4995a and HIST 4996a, The Senior Essay** Vanessa Ogle
All senior History majors should attend the mandatory senior essay meeting in early September at a time and location to be announced in the online Senior Essay Handbook. The senior essay is a required one- or two-term independent research project conducted under the guidance of a faculty adviser. As a significant work of primary-source research, it serves as the capstone project of the History major. Students writing the one-term senior essay enroll in HIST 497 (see description), not HIST 495 and 496. The two-term essay takes the form of a substantial article, not longer than 12,500 words (approximately forty to fifty double-spaced typewritten pages). This is a maximum limit; there is no minimum requirement. Length will vary according to the topic and the historical techniques employed. Students writing the two-term senior essay who expect to graduate in May enroll in HIST 495 during the fall term and complete their essays in HIST 496 in the spring term. December graduates enroll in HIST 495 in the spring term and complete their essays in HIST 496 during the following fall term; students planning to begin their essay in the spring term should notify the senior essay director by early December. Each student majoring in History must present a completed Statement of Intention, signed by a department member who has agreed to serve as adviser, to the History Department Undergraduate Registrar by the dates indicated in the Senior Essay Handbook. Blank statement forms are available from the History Undergraduate Registrar and in the Senior Essay handbook. Students enrolled in HIST 495 submit to the administrator in 237 HGS a two-to-three-page analysis of a single primary source, a draft bibliographic essay, and at least ten pages of the essay by the deadlines listed in the Senior Essay Handbook. Those who meet these requirements receive a temporary grade of SAT for the fall term, which will be changed to the grade received by the essay upon its completion. Failure to meet any requirement

may result in the student's being asked to withdraw from HIST 495. Students enrolled in HIST 496 must submit a completed essay to 211 HGS no later than 5 p.m. on the dates indicated in the Senior Essay Handbook. Essays submitted after 5 p.m. will be considered as having been turned in on the following day. If the essay is submitted late without an excuse from the student's residential college dean, the penalty is one letter grade for the first day and one-half letter grade for each of the next two days past the deadline. No essay that would otherwise pass will be failed because it is late, but late essays will not be considered for departmental or Yale College prizes. All senior departmental essays will be judged by members of the faculty other than the adviser. In order to graduate from Yale College, a student majoring in History must achieve a passing grade on the departmental essay.

* **HIST 4997a, One-Term Senior Essay** Vanessa Ogle
All senior History majors should attend the mandatory senior essay meeting in early September at a time and location to be announced in the online Senior Essay Handbook. The senior essay is a required one- or two-term independent research project conducted under the guidance of a faculty adviser. As a significant work of primary-source research, it serves as the capstone project of the History major. Seniors writing a two-term senior essay do not register for HIST 497; instead, they register for HIST 495 and HIST 496 (see description). History majors may choose to write a one-term independent senior essay in the first term of their senior year and register for HIST 497; however, students who choose the one-term senior essay option are not eligible for Distinction in the Major. The one-term essay must include a substantial research paper of no more than 6,250 words (approximately twenty-five pages) based on primary sources, along with a bibliographic essay and bibliography. Seniors enroll during the fall term of senior year; only History majors graduating in December may enroll during the spring term (or seventh term of enrollment). In rare circumstances, with the permission of the adviser and the Senior Essay Director, a student enrolled in HIST 497 during the fall term may withdraw from the course according to Yale College regulations on course withdrawal and enroll in the spring term. Each student enrolled in HIST 497 must present a completed Statement of Intention, signed by a department member who has agreed to serve as adviser, to the History Department Undergraduate Registrar by the dates indicated in the Senior Essay Handbook. Blank statement forms are available from the History Undergraduate Registrar and in the Senior Essay Handbook, available on the History department Web site. Additional details about the senior essay, including the submission deadlines are included in the Senior Essay Handbook. Essays submitted after 5 p.m. on the due date will be considered as having been turned in on the following day. If the essay is submitted late without an excuse from the student's residential college dean, the penalty is one letter grade for the first day and one-half letter grade for each of the next two days past the deadline. No essay that would otherwise pass will be failed because it is late. All senior departmental essays will be judged by members of the faculty other than the adviser. In order to graduate from Yale College, a student majoring in History must achieve a passing grade on the departmental essay. Permission of the departmental Senior Essay Director and of the student's faculty adviser is required for enrollment.

History of Art (HSAR)

* **HSAR 0024a, Nation and Empire in British Art** Tim Barringer
To celebrate the reopening of the Yale Center for British Art, this course investigates the key themes of national identity and imperial history by looking at works of art. It offers first year students an opportunity to study the world's finest collection of British paintings, sculpture, drawings, prints and rare books. Developing skills in visual analysis and engaging with historical contexts, the class will examine works of art in the relation to the fraught history of Britain and its empire. The industrial revolution, the role of women, the growth of cities and the rise of democratic politics will emerge as major themes. Looking at Britain's role in the world, we will undertake a critical appraisal of works of art produced in the North America, Caribbean, India, Australia and South Africa. HU

HSAR 1110a / ARCG 1110a, Introduction to the History of Art: Global Decorative Arts Staff
Global history of the decorative arts from antiquity to the present. The materials and techniques of ceramics, textiles, metals, furniture, and glass. Consideration of forms, imagery, decoration, and workmanship. Themes linking geography and time, such as trade and exchange, simulation, identity, and symbolic value. HU o Course cr

HSAR 1170a / HSHM 2240a / HUMS 4570a, Nature and Art, or The History of Almost Everything Staff
This global introductory course surveys the interrelation of nature and art from antiquity to the present. Throughout the semester, we consider a controversial question: is it possible to understand the history of art and science as a more-than-human story? Challenging traditional narratives of human progress, we attend to episodes of invention and destruction in equal measure. We discuss how art history is inseparable from histories of extracted resources, exploited species, environmental catastrophe, racialized and gendered understandings of the 'natural' and 'unnatural', and politicized understandings of land as power. At the same time, we explore how makers across cultures approached the natural world as a locus of the divine, a source of inspiration, and the ground for both scientific inquiry and the pursuit of self-knowledge. The very notions of art and artistic creation are impossible to define without recourse to nature as both a concept and a site of lived experience. This course is open to all, including those with no prior background in art history. Sections will include visits to collections and sites across Yale campus. HU o Course cr

HSAR 3219a / AMST 1197a / ARCH 2600a / HIST 1125a / URBN 1101a, American Architecture and Urbanism Staff
Introduction to the study of buildings, architects, architectural styles, and urban landscapes, viewed in their economic, political, social, and cultural contexts, from precolonial times to the present. Topics include: public and private investment in the built environment; the history of housing in America; the organization of architectural practice; race, gender, ethnicity and the right to the city; the social and political nature of city building; and the transnational nature of American architecture. HU o Course cr

* **HSAR 3230a / LAST 3230a, Illustrating Andean History: The Work of Guaman Poma** Staff
One of the most famous manuscripts to survive from the Spanish colonial Americas is the 1615 El primer nueva corónica y buen gobierno (The First New Chronicle, and Good Government, often called *Nueva corónica or New Chronicle*). The author was Indigenous Andean Felipe Guaman Poma de Ayala (c. 1535–c. 1616). This work is one of the most important sources for understanding Inka culture and colonial rule from an Indigenous perspective. It consists of 1,189 pages with 398 full-page ink line drawings. Few illustrated manuscripts survive from this period, and Guaman Poma's has no rival. The *New Chronicle* was written in Peru in Spanish, Quechua, Aymara, and Latin. But one might even consider the many images a fifth, purely visual language that combined Andean and European representation systems. Its images have become the most common illustrations of Andean history. In this course, we delve into the work's history and many-layered subtleties of its images to understand its import and the legacy of this Indigenous author. o Course cr

HSAR 3243a / ARCG 2143a / CLCV 1701a, Greek Art and Architecture Staff
Monuments of Greek art and architecture from the late Geometric period (c. 760 B.C.) to Alexander the Great (c. 323 B.C.). Emphasis on social and historical contexts. HU
o Course cr

* **HSAR 3270b / NELC 1040b, Art and Visual Culture in Ancient Egypt and Mesopotamia** Kathryn Slanski
In this course we investigate and compare the stunning visual culture of both ancient Egypt and Mesopotamia. We look into the purpose and function of 'art' in these two ancient societies, the intended audiences and the stylistic development of many different kinds of art, from sculpture to two-dimensional representations. We are planning for visits to West Campus to look at actual objects from the Peabody collections, the Yale Babylonian Collection, and (Covid-19 restrictions permitting) we are planning a trip to the Metropolitan Museum of Art. Additional aspects that are addressed in this course concern restoration and cultural heritage issues such as looting and repatriation of artifacts to their country of origin. HU

HSAR 3271a, Medieval People and Their Art Jacqueline Jung
Survey of the art and architecture of medieval Europe through a series of especially influential men and women who commissioned, inspired, designed, and used it, from 4th century CE through the early fifteenth century. Each lecture focuses on a different person (from kings, queens, emperors; revolutionary monks and visionary nuns; ascetic saints and extravagant nobles), and demonstrates how their historically particular concerns, interests, and ambitions played themselves out in the visual culture they sponsored. Field trip to the Met Cloisters. HSAR 112 is helpful, but not required. HU o Course cr

HSAR 3290a, Arts of the Silk Road Staff
This course offers a visual history of the art objects and other material goods that people set in motion, physically and imaginatively, across the Silk Roads regions of Eurasia from antiquity through the beginnings of the medieval era. It ranges across a variety of cultural productions and sites encompassing the agrarian and nomadic zones of Eurasia from the Bronze Age through the 7th-century rise of the first Caliphates in the west and the efflorescence of the Sui-Tang cosmopolis in the east. HU o Course cr

HSAR 3293a, Baroque Rome: Painting, Sculpture, Architecture Staff
Analyses of masterpieces by prominent artists in baroque Rome. Caravaggio's "baroque" differentiated from the path of the classicist artists. Works by Gian Lorenzo Bernini, who dominated the art scene in Rome as sculptor and architect half a century after Caravaggio's death. HU 0 Course cr

HSAR 3305a / EAST 2403a, Time in Chinese Art Staff
This class explores the theme of "time" in Chinese art from the traditional to the contemporary period. Drawing upon scholarship on Chinese philosophical understanding of time and clockworks, this course explores how art made manifest notions of the future, past, and present, the passage of time, *ksana*, aeons, eternity and deadlines. This class also investigates manipulations of time—how the unique format, artistic ideas and medium and materials of Chinese art helped to pause, rewind, compress and shorten time. Observing such temporalities, we analyze narrative murals and handscrolls, "this life" v. afterlife in funeral art, paintings of immortality, the significance of bronze corrosion in antiquarianism, uses of the past in traditional Chinese painting and contemporary art, the future and agelessness in movies and digital art, the materiality and nostalgia of old photography and time-based artworks, as well as the history of People's Republic of China as presented at the Tian'anmen Square. HU 0 Course cr

HSAR 3326a / ARCH 2001a, History of Architecture to 1750 Staff
Introduction to the history of architecture from antiquity to the dawn of the Enlightenment, focusing on narratives that continue to inform the present. The course begins in Africa and Mesopotamia, follows routes from the Mediterranean into Asia and back to Rome, Byzantium, and the Middle East, and then circulates back to mediaeval Europe, before juxtaposing the indigenous structures of Africa and America with the increasingly global fabrications of the Renaissance and Baroque. Emphasis on challenging preconceptions, developing visual intelligence, and learning to read architecture as a story that can both register and transcend place and time, embodying ideas within material structures that survive across the centuries in often unexpected ways. HU 0 Course cr

* **HSAR 4351a / CLCV 4771a, Ancient Art at the Edge of Empire** Alexander Ekserdjian
This seminar treats the art made in imperial contact zones, the 'edges of empire.' Focusing on two regions, Roman-period Syria–home of multiple linguistic and religious traditions and the point of convergence between the Parthian and Roman empires–and pre-Roman southern Italy, where Greek, Etruscan, Roman, and Indigenous Italian cultural elements co-existed, the course first explores the theories concerning art and empire formed for modern historical periods before turning to antiquity. The two main contexts under discussion allow us to investigate one 'edge' shared between two empires (Roman Syria) and in the other a world of many overlapping 'edges' (southern Italy ca. 400–100 BCE). The Yale University Art Gallery collections from the city of Dura-Europos in Roman Syria are used extensively. HU

* **HSAR 4361a / ARCH 2104a, How to Design a Renaissance Building** Morgan Ng
During the fifteenth and sixteenth centuries, European architects and their patrons conceived buildings of newfound scale and artistic ambition—buildings that vied in grandeur with the monuments of classical antiquity. Before realizing such structures, however, architects first had to draw and model them. What graphic mediums and tools allowed them to visualize such large, complex works? What imaginative processes

fueled their creativity? What innovations did they borrow from other disciplines, such as painting, sculpture, archaeology, and the geometrical sciences? And to what extent can scholars today reconstruct these past practices? HU

* **HSAR 4375a / HIST 3197a / HSHM 4410a, Museums: Power and Politics** Elaine Ayers

Museums are in a state of crisis. From calls for decolonization and repatriation to protests over human remains collections and unethical donor policies, museums and related cultural institutions find themselves at a crossroads, reckoning with their violent colonial histories while handling ongoing concerns about workers' rights, systemic inequality, and their role in shaping knowledge in the public sphere. Whether addressing climate change policy, Black Lives Matter protests, fights for unionization, or Indigenous representation, it's clear that museums are rich sites for critique in the history of science and beyond. How did we get here, and where do we go from here? Beginning with early modern cabinets of curiosity and moving through nineteenth century encyclopedic museums, controversial anatomical collections, and more recent natural history institutions, we investigate how museum politics and power produce knowledge, from the depths of their archives to sensationalized exhibits while questioning what an ethical, holistic museum might look like in the future. Amidst ongoing debates over controversial collections like the Benin Bronzes, human remains stored in universities across the United States, the Metropolitan Museum of Art's 2023 admission of looting practices, and the American Museum of Natural History's shallow apology for its eugenic past, the role of museums has expanded beyond the bounds of the academy, stoking universal struggles around human rights, international repatriation policies, and the politics of preservation, display, and loss. We bridge the classroom and the collection, visiting institutions around New Haven, practicing skills like provenance research and ethical handling of difficult objects while working towards a practice-based final project that suggests ways forward for museums and collections. WR, HU

* **HSAR 4380a, Originality** Joanna Fiduccia

An investigation of originality as a critical concept for modern thought and visual culture. Traveling across the spectrum of its divergent meanings—novelty, ingenuity, unconventionality, distinctiveness, authenticity, fundamentality, fidelity—we will track how originality came to be a desideratum of modern subjects, and how "originals" came to be their proper object of study and love. We will also consider how appeals to the elsewhere and erstwhile have buttressed the concept, reinforcing the presumed priority of a European center against a peripheral rest-of-the-world supposedly under its influence. Is originality a value to defend, or is it a resource claimed by some and denied to others? How have our increasingly sophisticated technical capacities for reproduction, replication, and most recently, generation, tested our intuitions about originality? Facing a seeming infinity of sources, as well as their forceful algorithmic channeling, what is original work today? Themes include: authorship and authenticity, sources and influence, anachronism and pseudomorphism, seriality, reproduction, appropriation and citation, style and similitude. HU

* **HSAR 4393b / EAST 4401b, The Transcultural Life of Things: Case Studies from East Asia** Staff

From production to circulation and consumption, the life of an artifact often unfolds across multiple geographic locations and varied environments. The movement of

things in space and time offers valuable insights into the waxing and waning of maritime and terrestrial networks that fostered transregional connectivity. This course introduces students to a variety of objects from premodern East Asia with a view to understanding the histories of intercultural exchange inscribed into their designs, materials, and itineraries. It begins by familiarizing students with methodologies, interpretive frameworks, and critical vocabulary for studying interconnected material cultures. The rest of the course is organized as a series of case studies on specific object types and structured into four modules, each focusing on a different sphere of exchange defined by shared geography, trade, religion, or ecosystem. Through this diverse group of objects, we will explore the entanglement of material culture with evolving structures of power, networks of interregional and long-distance exchange, and the physical environment in East Asia. HU

* **HSAR 4401a, Critical Approaches to Art History** Alexander Ekserdjian
A wide-ranging introduction to the methods of the art historian and the history of the discipline. Themes include connoisseurship, iconography, formalism, and selected methodologies informed by contemporary theory. WR, HU

* **HSAR 4405a / HUMS 3386a / ITAL 3386a, The Dark Side of The Italian Renaissance: Sex, Scandals, and Secrets** Simona Lorenzini and Deborah Pellegrino
The course explores the more controversial, hidden, and overlooked aspects of the Italian Renaissance. While this period is celebrated for its artistic, cultural, and intellectual achievements, it also had its fair share of intrigue, corruption, and moral complexities. Through love poems, secret letters, intricate networks, and political conspiracies, the course paints a vivid picture of the social and cultural landscape of Renaissance and early modern Italy. We look at the complex figure of Michelangelo, both as an artist and poet, focusing on his queer relationship with Tommaso de' Cavalieri and his friendship with Vittoria Colonna. We then discuss how Renaissance art, often commissioned by powerful individuals—such as Isabella D'Este's patronage of Leonardo da Vinci—was used to promote political or social agendas. We examine the alliances, betrayals, and murders that took place in Renaissance courts and how they shaped the political arena. Topics include the assassination of Lorenzo de' Medici's brother, Caterina de' Medici's agency, and Borgia's rise to power as well as the use of poison as a political instrument in power struggles and schemes to eliminate rivals. The course highlights radical and sharp-witted women writers, such as Moderata Fonte and Arcangela Tarabotti, who protested against a patriarchal society, and gave voice to those who challenged gender norms. By uncovering these compelling narratives through the intersection of literature, religion, history, art, and sexuality, the course offers a more nuanced and critical view on this acclaimed era. This course counts as language across the curriculum (LxC). HU

* **HSAR 4418a, Seeing, Describing, and Interpreting** Nicola Suthor
Study of select works of art from the period between 1500 and 1800, all on display in the Yale Art Gallery. Required readings of articles and theoretical text are meant to encourage discussion in front of the artwork. The importance of both visual and written information to better understand how artists communicate messages and engage imagination. All sessions held at the Yale Art Gallery. HU

* **HSAR 4421a / RLST 4210a, Saints and Relics in Medieval Europe** Jacqueline Jung
In medieval Europe, the dead were always present, and none had a greater impact on visual arts, material culture, and architecture than the "very special" dead known as saints. This course examines the men and women whose holy lives and often spectacular deaths loomed so large in the Christian imagination, including biblical saints such as the apostle Peter and Mary Magdalene, early martyrs such as St Stephen and St Foy, and thirteenth-century celebrities such as Francis of Assisi and Christina the Astonishing. We look at how their stories inspired iconic and narrative representations in various media (textual and visual), and how their bodily remains, enshrined in various forms of reliquaries, forged communities of the faithful over centuries. HU

* **HSAR 4449a / EAST 3401a, Nanban Art: Japan's Artistic Encounter with Early Modern Europe** Mimi Yiengpruksawan
Exploratory and investigative in nature, this seminar is conceived as a baseline engagement with the intersections of art, religion, science, commerce, war, and diplomacy at Kyoto and Nagasaki in the age of Japanese, Chinese, Portuguese, Spanish, Dutch, and English political and mercantile interaction in the sixteenth and seventeenth centuries. It addresses a set of themes whose point of entry is the entangled character of visual production and reception in Japan at a tipping point in the emergence of global modernity, when what were called the Nanbans—"Southern Barbarians," i.e. Europeans—began to arrive in Japan. The question of whether or not much-theorized nomenclatures such as *baroque*, *rococo*, *mestizo*, and even *global modernity* are pertinent to analysis from the Japanese and Asian perspective constitutes the backbone of the course and its primary objective in the study of a corpus of visual materials spanning the European and Asian cultural spheres. As such the seminar is not only about Japan, per se, or about Japanese objects, or the shogunal eye. It is equally about how Japan and Japanese objects and materials, along with objects and materials from other places, figured in a greater community of exchange, friction, confrontation, conquest, and adaptation in times when Portuguese marauders, Jesuit missionaries, Muslim traders, and Japanese pirates found themselves in the same waters, on ships laden with goods, making landfall in the domains of Japan's great military hegemons. HU

* **HSAR 4452a, Landscape, Mobility, and Dislocation** Jennifer Raab and Tim Barringer
The study of landscape, during the long nineteenth century, as a powerful and contested artistic medium that could express the ideologies of empire, philosophies of nature, the relationship between geography and vision, and constructions of self and other. Review of such issues in American landscape painting in both a transatlantic and transhemispheric context with specific attention to works in Yale collections. HU

* **HSAR 4460a / ENGL 3454a / HUMS 1850a, Writing about Contemporary Figurative Art** Margaret Spillane
A workshop on journalistic strategies for looking at and writing about contemporary paintings of the human figure. Practitioners and theorists of figurative painting; controversies, partisans, and opponents. Includes field trips to museums and galleries in New York City. WR, HU

* **HSAR 4492a / ER&M 3592a / SPAN 4600a, Visual Encounters in the Early Modern Atlantic** Catalina Ospina and Lisa Voigt
This course examines the visual, material, and human flows that connected Africa, Europe, and the Americas between 1450 and 1850 and gave its contours to the early

modern Atlantic World. Students explore the role of the visual in key institutions and phenomena that emerged in the circum-Atlantic and continue to cast their long shadow over the contemporary world. Topics include: colonialism, the slave trade, blackness and indigeneity, scientific exploration, religious encounters, and revolt. HU

* **HSAR 4499a, The Senior Essay** Joanna Fiduccia
Preparation of a research paper (25–30 pages in length) on a topic of the student's choice, under the direction of a qualified instructor, to be written in the fall or spring term of the senior year. In order to enroll in HSAR 499, the student must submit a project statement on the date that their course schedule is finalized during the term that they plan to undertake the essay. The statement, which should include the essay title and a brief description of the subject to be treated, must be signed by the student's adviser and submitted to the DUS. All subsequent deadlines are also strict, including for the project outline and bibliography, complete essay draft, and the final essay itself. Failure to comply with any deadline will be penalized by a lower final grade, and no late essay will be considered for a prize in the department. Senior essay workshops meet periodically throughout the term and are also mandatory. Permission may be given to write a two-term essay after consultation with the student's adviser and the DUS. Only those who have begun to do advanced work in a given area and whose project is considered to be of exceptional promise are eligible. The requirements for the one-term senior essay apply to the two-term essay, except that the essay should be 50–60 pages in length.

History of Science, Medicine, and Public Health (HSHM)

HSHM 2010a / EVST 2206a / HIST 1727a / HUMS 1060a / PHYS 1060a, Sustainable Energy: Physics and History
Students explore the physical logic of energy and power in parallel with the histories of technology for energy exploitation and economic theories of sustainability on the path to modernity. They learn the fundamentals of quantitative analysis of contemporary and historical energy harvesting, its carbon intensity, and climate impact. They also gain an understanding of the historical underpinnings of the current global energy status quo and its relationship to economic theories of sustainability. Mathematical proficiency with algebra is assumed. Students from all academic interests and experiences are welcome in the course. QR, SC, SO 0 Course cr

HSHM 2040a / AMST 1120a / EVST 1120a / HIST 1120a, American Environmental History Staff
Ways in which people have shaped and been shaped by the changing environments of North America from the nineteenth century to the present. Migration of species and trade in commodities; the impact of technology, agriculture, and industry; the development of resources in the American West and overseas; the conservation and environmental movements; planning and the impact of public policies; automobiles, highways, and urban growth; toxic chemicals, radiation, and environmental justice; climate change and energy transitions. WR, HU 0 Course cr

HSHM 2060a / HIST 1114a, Histories of American Reproductive Health, Rights, and Activism from 1800 Staff
Are all politics reproductive politics? This course traces the reproductive history of the United States from the early nineteenth century to the present day. Questions about reproduction—and about not reproducing—are deeply tied to questions of gendered and racial rights; of bodily autonomy; of American expansion and empire; and of who counts as a citizen, or even as a human being. In the past few years, we've encountered new stories about everything from new and restrictive abortion laws, to immigrant woman who were sterilized without their consent, to new technologies in male birth control, to the inequitable childcare burden that falls to women during times of hardship, to the racist roots of foster care and residential school systems. In this course, we come to understand the historical changes in American reproduction to better understand the complicated roots of our current moment. By analyzing articles in newspapers and scientific journals, advertisements, film, patient and physician narratives, and exhibitions and material culture, students will understand reproduction as a site for empowerment and activism, as a site of medical professionalization, and as a site of health disparity. We examine reproduction capaciously, including pregnancy and childbirth, birth control and abortion, assistive reproductive technologies, and adoption and foster care. Our analysis is intersectional, and we consider what different identities meant for reproduction historically, as well as in our current moment. HU
o Course cr

HSHM 2090b / EVST 2090b / HIST 1765b, Making Climate Knowledge Deborah Coen
This is a course about *how* humans have come to know what we know about our impacts on the earth's climate and our vulnerability to climate change. When did humans first *know* that their actions, in the aggregate, could transform the planet? Did scientists bear responsibility to warn of these consequences? In what ways has the modern science of climate both appropriated and undermined traditional and indigenous forms of climate knowledge? Students learn to work with the methods of history of science: we analyze science as a social and material process bound to the cultural and epistemological particularities of its historical context, and we examine the political dimensions of historical narratives about the emergence of the theory of global warming. Via hands-on experience with Yale's historical collections, students learn to analyze maps, artifacts, and instruments as historical sources. They also gain familiarity with the methods of environmental history, learning to attend to historical evidence of shifting relationships between humans and non-humans. Finally, students become more attuned to the evidence of climate change around them and more confident in their ability to make climate knowledge for themselves. HU

HSHM 2140b / HIST 3188b, Extraterrestrials in History Ivano Dal Prete
The notion of extraterrestrials and "radical others" in history and culture from antiquity to the present. Topics include other worlds and their inhabitants in ancient Greece; medieval debates on the plurality of worlds; angels, freaks, native Americans, and other "aliens" of the Renaissance; comet dwellers in puritan New England; Mars as a socialist utopia in the early twentieth century; and visitors from space in American popular culture. HU

HSHM 2210a / HUMS 1315a / RLST 1315a, What Was the University? Noreen Khawaja
A deep history of the university as a political, intellectual, and ritual institution. Focus on key chapters and cases in the university's formation, from the mutual-aid societies of medieval Europe to modern research institutions such as Yale. What conditions gave rise to the particular type of school we call a university? How have universities played a role in the development of modern society? How might the history of this institution help us understand its role at the center of politics today? HU o Course cr

HSHM 2240a / HSAR 1170a / HUMS 4570a, Nature and Art, or The History of Almost Everything Staff
This global introductory course surveys the interrelation of nature and art from antiquity to the present. Throughout the semester, we consider a controversial question: is it possible to understand the history of art and science as a more-than-human story? Challenging traditional narratives of human progress, we attend to episodes of invention and destruction in equal measure. We discuss how art history is inseparable from histories of extracted resources, exploited species, environmental catastrophe, racialized and gendered understandings of the 'natural' and 'unnatural', and politicized understandings of land as power. At the same time, we explore how makers across cultures approached the natural world as a locus of the divine, a source of inspiration, and the ground for both scientific inquiry and the pursuit of self-knowledge. The very notions of art and artistic creation are impossible to define without recourse to nature as both a concept and a site of lived experience. This course is open to all, including those with no prior background in art history. Sections will include visits to collections and sites across Yale campus. HU o Course cr

HSHM 2260a / HIST 1236a / HIST 236a, The Global Scientific Revolution Staff
The material, political, cultural, and social transformations that underpinned the rise of modern science between the 14th and 18th century, considered in global context. Topics include artisanal practices and the empirical exploration of nature; global networks of knowledge and trade, and colonial science; figurative arts and the emersion of a visual language of anatomy, astronomy, and natural history. HU o Course cr

HSHM 2270b / HIST 1275, Botanical Bodies: Plants, Medicine and Colonial Science Elaine Ayers
Plants weave their way into every aspect of our lives. From the food that we eat to our growing obsession with houseplants, from the pharmaceutical industry to recent meditations on queerness and reproductive freedom, plants are inescapable, offering both practical and metaphoric roots, tendrils, and blossoming ideas about our own bodies and our engagement within changing social, political, and cultural structures. This course considers the ways that plants (and fungi) have shaped ideas about gender, sexuality, race, health, medicine, capitalism, power, and consciousness from the early modern period to the present, moving chronologically to examine our complicated relationships with the natural world. Working within the (broadly construed and ongoing) colonial context, we follow plants and their collectors, cultivators, and stewards across oceans and continents, charting the rise of plantation agriculture and specious ways of classifying species to twentieth-century focuses on breeding and genetics, attempts to patent plants as medicines, and, in recent years, calls to use plants as models for new (or, perhaps, very old) models for kinship that upturn these very systems of power. HU o Course cr

HSHM 2321b / HIST 1744b, Cultures of Western Medicine John Warner
A survey of Western medicine and its global encounters, encompassing medical theory, practice, institutions, and healers from antiquity to the present. Changing concepts of health, disease, and the body in Europe and America explored in their social, cultural, economic, scientific, technological, and ethical contexts. HU o Course cr

HSHM 2330a / HIST 1763a, The Politics of Global Health, 1850–Present Staff
This course explores the emergence of global health from the 1851 International Sanitary Conference in Paris to contemporary global health and examines how health initiatives and policies have evolved over the last 150 years. We begin by examining the impact of colonialism on health systems, highlighting the introduction of Western medicine that dismantled local health systems and established healthcare infrastructures that primarily served colonial and elite interests. We then explore the rise of international health organizations, such as the Rockefeller Foundation, the League of Nations Health Organization (LNHO), and the World Health Organization (WHO), and the role of multilateral institutions in shaping global and local health policy in the postwar period. We also evaluate health missions between the Socialist bloc and the Third World and assess the successes and limitations of these alternative visions for promoting health equity. Over the course of the semester, we examine the experiences of health interventions and eradication programs from the perspective of recipient communities and gain an understanding of resistance, contestations, and adoption of these programs. Challenging dominant narratives that portray recipients of global health projects as passive, we evaluate how marginalized communities have variously resisted, appropriated, and shaped global technologies and ideas. Importantly, rather than following a linear North (donor) -to-South (recipient) model, we examine how the contemporary global health landscape emerged as the result of the exchange of ideas, technologies, and local knowledge and expertise between the Global North and South HU o Course cr

HSHM 2490b / HIST 1129b, The Good Death: A History Deborah Streahle
Can a death be "good" or "bad?" How so? Who gets to decide? Students in this course trace how the idea of "the good death" changed through U.S. history. Together, we consider several questions that have been used to evaluate the "goodness" of a death, asking: Is there a right time to die? Can a good death be planned? Is there a right attitude or spiritual stance to have toward death? Where does a good death take place? What kind of care is best for dying people? What should be done with dead bodies? How does grief factor into the good death? Over the semester, students investigate both aspirational visions of the good death as well as the realities of death in U.S. history. We analyze cultural, social, and medical factors that influenced the professionalization and medicalization of death into the 21st century. In addition, students are asked to probe their own assumptions about the good death and its corollary, the good life. The course culminates in an essay that features self-reflection as well as rigorous historical analysis. HU o Course cr

HSHM 2520a / AFAM 2150a / ER&M 2534a / HIST 1131a, History of Anti-Black Racism and Medicine Staff
The course traces how anti-Black racism shaped the development of western medicine in the Americas. It examines how ideas of anti-Blackness shaped the work of health practitioners and the experiences of patients. It engages the emergence of racial science and scientific racism, and how they contributed to the production of medical

knowledge. More importantly, it centers the voices and experiences of Black people, and the various ways challenged racism through knowledge production and activism. It also addresses the enduring legacies of anti-Black racism in medical practice, and its impact on health inequality. HU o Course cr

* **HSHM 4060a or b / HIST 3150a or b, Healthcare for the Urban Underserved** Sakena Abedin

Exploration of the institutions, movements, and policies that have attempted to provide healthcare for the urban underserved in America from the late nineteenth century to the present, with emphasis on the ideas (about health, cities, neighborhoods, poverty, race, gender, difference, etc) that shaped them. Topics include hospitals, health centers, public health programs, the medical civil rights movement, the women's health movement, and national healthcare policies such as Medicare and Medicaid. WR, HU

* **HSHM 4090a / HIST 3170a, Community Histories: Reproductive Health in New Haven** Megann Licskai

How does a local focus help us to understand the history of reproductive health, and how does reproductive health help us to understand local history? As a project within Yale's Community Histories Lab, students join a team of Yale researchers and community partners committed to producing new knowledge about the history of health in New Haven. Students collaboratively build an archive of reproductive health histories in New Haven. This archive will be a site of academic interest, developed in response to community needs as we consider how to leverage historical research to imagine a better future. The first unit provides students with targeted methodological training in oral historical and traditional archival methods in preparation of the collection of oral histories and compilation of paper archives. The remainder of the seminar engages these methods in project work. Students use their training to build a publicly accessible reproductive health archive housed at Yale, to develop their own research questions coming out of this nascent archive, and to support New Haven organizations that can use these histories to serve their communities. WR, HU o Course cr

* **HSHM 4150b / HIST 3195b, Historical Perspectives on Science and Religion** Ivano Dal Prete

The engagement between science and religion from a historical standpoint and a multicultural perspective. The Islamic, Jewish, Buddhist, and Christian traditions; the roots of modern creationism; salvation expectations and the rise of modern science and technology. WR, HU

* **HSHM 4180a / AMST 2253 / ENGL 2853 / HIST 3742a / SOCY 3233 / WGSS 4435a, Queer Science** Juno Richards

Why are there so many studies involving trans brain scans? Can facial recognition technology really tell if you're queer? Why is everyone so obsessed with gay penguins? For that matter, how did science come to be the right tool for defining and knowing sex, gender, and sexuality at all? How does that history influence our collective lives in the present, and what are some alternatives? This course gives students a background in the development of sex science, from evolutionary arguments that racialized sexual dimorphism to the contemporary technologies that claim to be able to get at bodily truths that are supposedly more real than identity. It introduces scholarly and political interventions that have attempted to short-circuit the idea that sex is stable and knowable by science, highlighting ways that queer and queering thinkers have

challenged the stability of sexual categories. It concludes by asking how to put those interventions into practice when so much of the fight for queer rights, autonomy, and survival has been rooted in categorical recognition by the state, and by considering whether science can be made queer. HU

* **HSHM 4200a or b, Senior Project Workshop** Megann Licskai
A research workshop for seniors in the HSHM major, intended to move students toward the successful completion of their senior projects and to provide a community for support and for facilitated peer review. Meets periodically throughout the semester for students to discuss stages of the research process, discuss common challenges and practical strategies for addressing them, and to collaboratively support each others' work. The workshop events are structured around the schedule for the fall-to-spring two-term senior project, but students writing one-term projects or spring-to-fall projects also benefit from them, and there is at least one peer review session to support their key deadlines each semester too. Students completing their senior project in the same semester as the workshop have to share their key findings with peers in a celebratory discussion of key ideas, findings, and processes. Students may take both the Fall and the Spring workshop or select the semester that best helps them complete the SP. Students must be seniors in the HSHM major and must be signed up for HSHM 490, 491, or 492 to take this course. ½ Course cr

* **HSHM 4230a / HIST 3175a, Healing Spaces in U.S. History** Deborah Streahle
Where does healing happen? Is place an important factor in health care? How has the design of a space influenced health? What is the relationship between nature and health? Students in this course investigate healing spaces in the history of American medicine and consider how space has been understood to interact with health. We discuss health care in institutions, mobile settings, and natural spaces. From ambulances and hospitals to homes and gardens, we consider the impact of setting on patients and practitioners. The course draws on resources local to New Haven as well as guest speakers. Students can expect to emerge from the course familiar with several healing spaces in New Haven and with the way space has impacted broader health care. While the course focus on U.S. history, I welcome student contributions addressing healing spaces beyond the U.S. WR, HU

* **HSHM 4240b / HIST 3178b, Health Activism in U.S. History** Deborah Streahle
How have activists changed health care? How have health concerns become political? This course explores health activism and advocacy via case studies drawn from U.S. history from 19th-century sanitary reform to 21st-century environmental justice. Throughout the course, students examine movements, figures, and tactics that have shaped health policy and practice. We analyze the role of grassroots organizations, policy advocacy, and public campaigns in shaping health policy and addressing health inequities. Themes include: the intersection of health and social justice; the role of government and policy in health care; the influence of social movements on health reform; and strategies for effective advocacy and activism. Students engage with a variety of primary sources, including historical documents, speeches, art, and personal narratives, and emerges with an ability to analyze health activism in historical context. WR, HU

* **HSHM 4280a / HIST 3174a, Technology and American Medicine** Deborah Streahle
This course explores the material culture of American medicine. From instruments like thermometers and scalpels to imaging tools like X-rays and MRIs to everyday aids like

glasses, prosthetics and fitness tracking apps—technology suffuses medicine today. In this course, we analyze particular technologies as both physical and cultural objects in historical context. In addition to investigating the definition of medical technology, also consider a range of themes and questions, among them: why do some technologies succeed and others fail? What is the relationship between medical technology and power? How do race, class, gender, and sexuality impact the creation and use of medical technology? We pay particular attention to the themes of expertise, authority, and identity. In addition to reading primary and secondary sources, students work closely with materials from the Medical Historical Library. Students can expect to emerge from the course prepared to analyze medical technologies and place them in historical context in American medicine. The course culminates in a student-run virtual exhibition of medical technologies WR, HU

* **HSHM 4330a / HIST 3719a / WGSS 4419a, Gender and Science** Deborah Coen
Exploration of the dual potential of the sciences to reinforce received ideas about gender or to challenge existing sexual and racial hierarchies; the rise of the ideas and institutions of the modern sciences as they have reflected and shaped new notions of femininity and masculinity. WR, HU

* **HSHM 4380a / HIST 3761a, Unnatural History: Colonialism and Inequality in the Making of Nature** Elaine Ayers
Penetrated jungles, "mother" nature, and quests to preserve the redwoods—for hundreds of years, colonial agents have characterized environments in racialized, gendered, sexualized, classist, and ableist terms, anthropomorphizing nature along ongoing systems of inequality. This class traces shifting conceptualizations of nature from the early modern period to the present, focusing on how naturalists and scientists have described, collected, and displayed "new" environments and peoples while building extractive and exploitative natural history collections, from cabinets of curiosity to Yale's own Peabody Museum. By analyzing methodologies like classification, conservation, and scientific communication, we will discuss how divisions between the "natural" and "unnatural" were created in western cultures along unequal ideas about human bodies. Critical analyses of sources across multiple disciplines will inform conversations about knowledge production with the goal of interrogating how these power structures have silenced voices and enacted long-lasting violences on both environments and the peoples inhabiting them. Using both primary and secondary sources while conducting original research, students will learn how binary and reductive categories have been used and abused in colonial science and beyond. This class will include visits to museums around Yale's campus and beyond, with two of your assignments focused on the Peabody Museum. WR, HU

* **HSHM 4410a / HIST 3197a / HSAR 4375a, Museums: Power and Politics** Elaine Ayers
Museums are in a state of crisis. From calls for decolonization and repatriation to protests over human remains collections and unethical donor policies, museums and related cultural institutions find themselves at a crossroads, reckoning with their violent colonial histories while handling ongoing concerns about workers' rights, systemic inequality, and their role in shaping knowledge in the public sphere. Whether addressing climate change policy, Black Lives Matter protests, fights for unionization, or Indigenous representation, it's clear that museums are rich sites for critique in the history of science and beyond. How did we get here, and where do we go from here?

Beginning with early modern cabinets of curiosity and moving through nineteenth-century encyclopedic museums, controversial anatomical collections, and more recent natural history institutions, we investigate how museum politics and power produce knowledge, from the depths of their archives to sensationalized exhibits while questioning what an ethical, holistic museum might look like in the future. Amidst ongoing debates over controversial collections like the Benin Bronzes, human remains stored in universities across the United States, the Metropolitan Museum of Art's 2023 admission of looting practices, and the American Museum of Natural History's shallow apology for its eugenic past, the role of museums has expanded beyond the bounds of the academy, stoking universal struggles around human rights, international repatriation policies, and the politics of preservation, display, and loss. We bridge the classroom and the collection, visiting institutions around New Haven, practicing skills like provenance research and ethical handling of difficult objects while working towards a practice-based final project that suggests ways forward for museums and collections. WR, HU

* **HSHM 4440b / HIST 3750b, Health, Humanitarianism, and Refugee Politics** Gourav Krishna Nandi

How have states historically determined which bodies deserve asylum and care and which can be exposed to deportation, detention, and violence? How have colonial depictions of Asia and Africa as racialized geographies continued to shape migration policies and humanitarian practices throughout the twentieth century? In this seminar, we explore how states and humanitarian actors have utilized technologies of surveillance and control to govern the lives and movements of migrants and refugees throughout the twentieth century. We consider the multifarious reasons why communities, especially throughout Asia, have been mobile since the beginning of the nineteenth century and how this mobility has been shaped through colonial biomedical regimes. Critically interrogating Western images of Global South refugees seeking asylum in the Global North, we investigate contemporary gendered and racialized images of the "good refugee" or migrant who "deserve" consideration in the modern humanitarian system through biomedical categories. Students are expected to apply historical insights to contemporary debates surrounding surveillance, citizenship, and the global migration regime, challenging prevailing narratives and exploring alternative perspectives on refugee surveillance regimes. WR, HU

* **HSHM 4450b / HIST 3139b, Fetal Histories: Pregnancy, Life, and Personhood in the American Cultural Imagination** Megann Licskai

In our twenty-first-century historical moment, the fetus is a powerful political and cultural symbol. One's fetal politics likely predicts a lot about how they live their life, vote, worship, and even about how they understand themselves. How, then, has the fetus come to carry the cultural significance that it does? Are there other ways one might think of the fetus? And what is happening in the background when we center the fetus up front? This course examines the many cultural meanings of the fetus in American life: from a clump of cells, to a beloved family member, to political litmus test, and considers the way that these different meanings are connected to questions of human and civil rights, gender relations, bodily autonomy, and political life. We look at the history of our very idea of the fetus and consider how we got here. Each of us may have a different idea of what the fetus is, but every one of those ideas has

a particular history. We work to understand those histories, their contexts, and their possible implications for the future of American political life. WR, HU

* **HSHM 4480a / HIST 3177a / WGSS 4448a, American Medicine and the Cold War** Naomi Rogers

The social, cultural, and political history of American medicine from 1945 to 1960. The defeat of national health insurance; racism in health care; patient activism; the role of gender in defining medical professionalism and family health; the rise of atomic medicine; McCarthyism in medicine; and the polio vaccine trials and the making of science journalism. WR, HU

* **HSHM 4550b / AMST 4407b / ER&M 3691b, Eugenics and its Afterlives** Daniel HoSang

This course examines the influence of Eugenics research, logics, and ideas across nearly every academic discipline in the 20th century, and the particular masks, tropes, and concepts that have been used to occlude attentions to these legacies today. Students make special use of the large collection of archives held within Yale Special Collections of key figures in the American Eugenics Society. Students work collaboratively to identify alternative research practices and approaches deployed in scholarly and creative works that make racial power visible and enable the production of knowledge unburdened by the legacies of Eugenics and racial science. HU o Course cr

* **HSHM 4580a or b / HIST 3179a or b, Scientific Instruments & the History of Science** Paola Bertucci

What do scientific instruments from the past tell us about science and its history? This seminar foregrounds historical instruments and technological devices to explore how experimental cultures have changed over time. Each week students focus on a specific instrument from the History of Science and Technology Division of the Peabody Museum: magic lantern, telescope, telegraph, astrolabe, sundial, and more! WR, HU

* **HSHM 4630b / AFAM 3170b / HIST 172Jb, Care Work: Intersectional Pedagogical, Experiential, and Theoretical Approaches to Healing** Ayah Nuriddin

What does it mean to "care"? What models of care work do we need to attend to current crises? What models of care work can we learn from the past? Can we imagine a world where the concept of care, in its most inclusive, embracing, holistic, liberatory form operates as a fundamental value driving our global societies? These are some of the questions that inspired the creation of this course. In this seminar, students explore theoretical feminist, Black feminist, and Crip-of-Color perspectives of care work as well as experiential healing modalities that might interrupt cycles of harm often experienced by care workers. HU

* **HSHM 4640a / HUMS 4183a, Nature and Human Nature** Gary Tomlinson

This course explores the Western conception of the human place in the natural world as it has shifted across four centuries. It features, alongside corollary readings, close study of three classic texts: Galileo's *Dialogue Concerning the Two Chief World Systems* (1632), Giambattista Vico's *New Science* (1744), and Darwin's *Origin of Species* (1859) #fundamental texts locating humans in the cosmos, in society, and in natural history, respectively. It finishes with a new work, Terrence Deacon's *Incomplete Nature* (2011), an attempt to explain the emergence of mind from the natural world.

No prerequisites, though the challenging nature of the materials suggests that this course will be aimed mainly at students beyond their first year. HU

* **HSHM 4670b / HIST 3747b / HIST 447J / WGSS 4465b, History of the Body** Ziv Eisenberg
What does it mean to have a "bad hair day?" How should you care for your skin? What happens when you eat a burger and drink wine? How are babies made? What happens when you die? The answers depend not only on who provides them, but also on where and when. This seminar examines historical production of systems of corporeal knowledge and power, as well as the norms, practices, meanings, and power structures they have created, displaced, and maintained. Structured thematically, the course familiarizes students with major topics in the history of the body, health, and medicine, with a particular focus on US history. WR, HU

* **HSHM 4680a / HIST 3260a, Sex, Life, and Generation** Ivano Dal Prete
Theories and practices of life, sex, and generation in Western civilization. Politics and policies of conception and birth; social control of abortion and infanticide in premodern societies; theories of life and gender; the changing status of the embryo; the lure of artificial life. WR, HU

HSHM 4700a or b, Directed Reading Elaine Ayers
Readings directed by members of the faculty on topics in the history of science, medicine, or public health not covered by regular course offerings. Subjects depend on the interests of students and faculty. Weekly conferences; required papers.

* **HSHM 4730b / HIST 3703b, Vaccination in Historical Perspective** Jason Schwartz
For over two centuries, vaccination has been a prominent, effective, and at times controversial component of public health activities in the United States and around the world. Despite the novelty of many aspects of contemporary vaccines and vaccination programs, they reflect a rich and often contested history that combines questions of science, medicine, public health, global health, economics, law, and ethics, among other topics. This course examines the history of vaccines and vaccination programs, with a particular focus on the 20th and 21st centuries and on the historical roots of contemporary issues in U.S. and global vaccination policy. Students gain a thorough, historically grounded understanding of the scope and design of vaccination efforts, past and present, and the interconnected social, cultural, and political issues that vaccination has raised throughout its history and continues to raise today. HU

* **HSHM 4740a / HIST 3415a / SAST 3640a, Health, Medicine and Science in Modern South Asia** Gourav Krishna Nandi
In this seminar, we explore health, medicine, and science in South Asia during the 19th and 20th centuries, and examine how networks and circulations of medical knowledge, local and transnational actors, and anticolonial physicians and scientists shaped colonial modernities and postcolonial nationalism in the region. In the first part, we examine the establishment of colonial medicine in British India, colonial interventions during plague visitations, and approaches to famine and food in the 19th century. We explore how science in colonial India was intertwined with anticolonialism, and examine anticolonial arguments against famines using modern economic sciences. In the second part, we explore pluralist practices of medicine in colonial South Asia and analyze how diverse approaches of colonial Indian medical practitioners blur the categories of "traditional" and "modern" medicine. We then focus on colonial and postcolonial public health interventions—including, regulating poisons and adulterated food, population control, and vaccination campaigns—and their contestations. In the final part, we focus on the postcolonial state and explore how scientific nationalism shaped

the postcolonial state's approaches to modernization and development. We examine how Indian physicists and surgeons created and maintained knowledge networks using alliances on both sides of Cold War rivalries. WR, HU

* **HSHM 4900a or b and HSHM 4910a or b, Yearlong Senior Project** Megann Licskai
Preparation of a yearlong senior project under the supervision of a member of the faculty. There will be a mandatory meeting at the beginning of the term for students who have chosen the yearlong senior project; students will be notified of the time and location by e-mail before classes begin. Majors planning to begin their projects who do not receive this notice should contact the senior project director. Students expecting to graduate in May enroll in HSHM 490 during the fall term and complete their projects in HSHM 491 in the spring term. December graduates enroll in HSHM 490 in the spring term and complete their projects in HSHM 491 during the following fall term. Majors planning to begin their projects in the spring term should notify the senior project director by the last day of classes in the fall term. Students must meet progress requirements by specific deadlines throughout the first term to receive a temporary grade of SAT for HSHM 490, which will be changed to the grade received by the project upon the project's completion. Failure to meet any requirement may result in the student's being asked to withdraw from HSHM 490. For details about project requirements and deadlines, consult the HSHM Senior Project Handbook. Students enrolled in HSHM 491 must submit a completed project to the HSHM Registrar no later than 5 p.m. on the due date as listed in the HSHM Senior Project Handbook. Projects submitted after 5 p.m. on the due date without an excuse from the student's residential college dean will be subject to grade penalties. Credit for HSHM 490 only on completion of HSHM 491.

* **HSHM 4930a / AMST 3302a / ER&M 3012a / WGSS 3312a, Technology, Race and Gender** Kalindi Vora
In this course, we discuss technology and the politics of difference through a survey of topics including artificial intelligence, digital labor (crowdsourcing), and robotics and computer science. Materials for study include humanistic and social scientific critique, ethnographies of technology, technical writing and scientific papers, as well as speculative art practices including design, visual art and fiction. What assumptions and politics of imagination govern the design and development of new technologies? What alternative imaginaries, politics, or even speculations, can be identified with a feminist analytic lens? The seminar also includes a practicum component where we practice the politics of speculation through writing and design projects. To do this we study everything from active STEM projects at Yale to speculative fiction and film to think about how structures of race, gender, sexuality, ability, nation, and religious difference inform how we "speculate" or imagine the future through the ways we design and build technological worlds in practice and in fiction. HU, SO

Human Rights Studies (HMRT)

Humanities (HUMS)

* **HUMS 0204a / ITAL 0030a, Six Global Perspectives on Knights** Alessandro Giammei
What do Batman (the Dark Knight) and Orlando (Charlemagne's wise paladin) have in common? What is the thread that connects the Jedi knights of *Star Wars*

and those that sat around king Arthur's round table? How did medieval history and Renaissance poetry inform the expanded universes of superhero movies and fantasy literature, along with the inexhaustible fan-fiction that further extends and queers them? Chivalry, as a code of conduct and a network of symbols, inspired some of the most entertaining stories of the so-called Western canon, blurring the divide between high and popular culture. It offered storytellers (and nerds) of all ages a set of norms to question, bend, and break—especially in terms of gender. It challenged the very format of books, re-defining for good concepts like literary irony, seriality, and intermediality. This seminar proposes six pretty good trans-historical archetipes of fictional knights, combining iconic figures such as Marvel's Iron Man and Italo Calvino's Agilulfo, Ludovico Ariosto's Bradamante and *Game of Thrones*' Brienne of Tarth, Don Quixote and the Mandalorian. By analyzing together their oaths, weapons, armors, and destinies we aim to develop reading and writing skills to tackle any text, from epic and scholarship to TV-shows and comic-books. Enrollment limited to first-year students. Students enroll concurrently with HUMS 0299, Six Global Perspectives Lab. WR, HU 0 Course cr

HUMS 214b / EALL 2190b / EAST 2201b / PHIL 1119b / RLST 171b, Introduction to Chinese Philosophy Lucas Bender

This course represents an introduction to the most important philosophical thinkers and texts in Chinese history, ranging from roughly 500 BC–1500 AD. Topics include ethics, political philosophy, epistemology, and ontology. We discuss the basic works of Confucian and Daoist philosophers during the Warring States and early imperial eras, the continuation of these traditions in early medieval "dark learning," Buddhist philosophy (in its original Indian context, the early period of its spread to China, and in mature Chinese Buddhist schools such as Chan/Zen), and Neo-Confucian philosophy. The course emphasizes readings in the original texts of the thinkers and traditions in question (all in English translation). No knowledge of Chinese or previous contact with Chinese philosophy required. HU TR 0 Course cr

* **HUMS 0220a / ENGL 0820a, Six Global Perspectives on Biography** Ernest Mitchell

This course focuses on the humanities through an intensive study of transatlantic biographers. We examine six roles biographers can play: the archivalist, the contemporary, the fictionalizer, the listener, the miniaturist, and the systematizer. Our readings range widely over cultures, places, and times: from Senegalese griots to the *Lives* of Mary Shelley; from Gertrude Stein's "autobiographies" to the microbiographies of Jorge Luis Borges; from fragments by Walter Benjamin to Daphne Brooks' liner notes on Beyoncé. We devote sustained attention to developing writing skills and introduce students to the special collections, art galleries, and rare books libraries of Yale. Friday sessions alternate between writing workshops and field trips to Yale collections. This course is part of the "Six Pretty Good Ideas" program. Enrollment limited to first-year students. Students enroll concurrently with HUMS 0299, Six Global Perspectives Lab. WR, HU 0 Course cr

* **HUMS 0240a / CPLT 0310a / EALL 020 / EALL 0200a, Six Global Perspectives on Poetry** Lucas Bender

This first-year seminar in the Six Global Perspectives series offers an introduction to college-level Humanities courses. We read six poems that are considered among the greatest in their very different cultural traditions. By filling in how each of these traditions understood the art of poetry, we consider the ways that verse, across cultures

and historical eras, has allowed authors to navigate the challenging relationship between the universal and the particular. We make extensive use of Yale's rich manuscript archives, historical object collections, and art galleries, and we devote sustained attention to improving academic writing skills. Friday lab sessions alternate between writing workshops and field trips to Yale collections. Enrollment limited to first-year students. Students enroll concurrently with HUMS 0299, Six Global Perspectives Lab. WR, HU

* **HUMS 0245a / NELC 0090a, Six Global Perspectives on Evil: Murder, Law, and True Crime in History** Staff

Harem conspiracies, kings' assassinations, self-defense killings, witch hunts, and serial murderers. The history of murder, violence, and criminal investigation is as old as humankind. Yet, crime is not always considered evil, nor is evil always associated with crime. In this course, we discuss how the way evil was perceived and crime was punished has changed throughout history. From mythical accounts of murders, to real records of trials of humans, animals, and even objects accused of homicide or witchcraft, we analyze how aspects of social status or gender played a role in shaping punishment across Eastern and Western civilizations. We compare codified-law civilizations to those in which custom, social pressure, and community ethics determined correct behavior. Four historical cold cases with accompanying evidence are presented for in-class debate, and… perhaps students may be able to help solve an old mystery! At the end of the semester, we recreate historical trials using the same crime, evidence, and participants, but following the law and procedures of each one of the historical settings covered in this course. Will the verdict and sentence be any different? Friday sessions alternate between writing workshops and field trips to Yale collections. Enrollment limited to first-year students. Students enroll concurrently with HUMS 0299, Six Global Perspectives Lab. WR, HU RP 1½ Course cr

* **HUMS 0320b / AMST 0029b / AMST 029 / ENGL 0729b, Henry Thoreau** Michael Warner

Henry Thoreau played a critical role in the development of environmentalism, American prose, civil rights, and the politics of protest. We read his writing in depth, and with care, understanding it both in its historical context and in its relation to present concerns of democracy and climate change. We read his published writing and parts of the journal, as well as biographical and contextual material. The class makes a field trip to Walden Pond and Concord, learning about climate change at Walden as revealed by Thoreau's unparalleled documentation of his biotic surroundings. Student's consider Thoreau's place in current debates about the environment and politics, and are encouraged to make connection with those debates in a final paper. Previously ENGL 029. Enrollment limited to first-year students. HU

* **HUMS 0350a / HIST 0125 / HUMS 035 / PLSC 0243a, The American Death Penalty** Lincoln Caplan

This first-year seminar focuses on the U.S. Supreme Court's 44-year experiment in regulating the American death penalty. The aims of the course are to have students learn about the workings and history of the system of capital punishment in the U.S, which is one of the most controversial elements of American criminal justice, and decide whether, in their view, the experiment is succeeding or failing—why and how. For students interested in the criminal justice system. Enrollment limited to first-year students. SO

* **HUMS 0360b / HIST 0623b / JDST 0035b / RLST 0035b, Jerusalem: Judaism, Christianity, Islam** Sarit Kattan Gribetz

The Old City of Jerusalem is just 0.35 square miles large, about half the size of Yale's campus. Have you ever wondered what makes this tiny city so beloved to—and the object of continual strife for—Jews, Christians, and Muslims? Through engagement with a wide range of sources—including biblical lamentations, archeological excavations, qur'anic passages, exegetical materials, medieval pilgrim itineraries, legal documents, maps, poetry, art, architecture, and international political resolutions—students develop the historiographical tools and theoretical frameworks to study the history of one of the world's most enduringly important and bitterly contested cities. Students encounter persistent themes central to the identity of Jerusalem: geography and topography; exile, diaspora, and return; destruction and trauma; religious violence and war; practices of pilgrimage; social diversity; missionizing; the rise of nationalism; peace efforts; the ethics of storytelling; and the stakes of studying the past. Enrollment limited to first-year students. HU RP

* **HUMS 0410a / GMAN 0400a, The Top Ten: Best Books of the 21st Century** Sophie Schweiger

In 2025, *The New York Times* published a list of "The Best 100 Books of the 21st Century." We will not read all of them. Instead, we will ask what it means to rank literature in the first place, as our class takes a closer look at some the different measures by which books can be made subject to a ranking—for example: sales numbers, expert opinion, and critical acclaim, or success through translation and adaptation. We study the different ways of awarding book prizes and curating lists of literature. Additionally, we study the circumstances that lead to literary "hypes," including Netflix adaptations, BookTok, and the author-as-celebrity. We read novels and excerpts of novels by some of the *New York Times'* top-ranked authors, as well as by Nobel Prize laureates of recent years, and compare the different modes of selection and the benefits as well as biases inherent to the respective lists. We also look at currently circulating lists of "banned books" and the works of literature banned from official reading lists and syllabi to understand another aspect of the politics behind the curation of lists. We close our literary journey with a text by author Toni Morrison who, curiously, made all three lists. Enrollment limited to first-year students. HU

* **HUMS 434b / CLCV 1381b / NELC 1300b, Mesopotamia's Literary Legacy** Kathryn Slanski

This seminar explores myth, epic, love poetry, and wisdom literature from the ancient Near East, ca. 3000–323 BCE, within its own cultural context and in dialogue with literature from ancient Greece and the Hebrew Bible, conduits by which the literary legacy of the ancient Near East has left its mark on the Western tradition. HU

* **HUMS 0650a / EDST 0165a / EDST 065, Education and the Life Worth Living** Matthew Croasmun

Consideration of education and what it has to do with real life—not just any life, but a life worth living. Engagement with three visions of different traditions of imagining the good life and of imagining education: Confucianism, Christianity, and Modernism. Students will be asked to challenge the fundamental question of the good life and to put that question at the heart of their college education. Enrollment limited to first-year students. HU

* **HUMS 0750a, Mastering the Art of Watercolor** Adam Van Doren
An introductory course on the art of watercolor as a humanistic discipline within the liberal arts tradition. Readings, discussions, and studio work emphasize critical, creative thinking through a tactile, "learning by doing" study of the watercolor medium. Students analyze and imitate the classic techniques of J. M.W. Turner, John Singer Sargent, Georgia O'Keeffe, and Edward Hopper, among others. Studio components include painting *en plein air* to understand color, form, perspective, composition, and shade and shadow. Basic drawing skills recommended. Enrollment limited to first-year students. HU RP

HUMS 1060a / EVST 2206a / HIST 1727a / HSHM 2010a / PHYS 1060a, Sustainable Energy: Physics and History
Students explore the physical logic of energy and power in parallel with the histories of technology for energy exploitation and economic theories of sustainability on the path to modernity. They learn the fundamentals of quantitative analysis of contemporary and historical energy harvesting, its carbon intensity, and climate impact. They also gain an understanding of the historical underpinnings of the current global energy status quo and its relationship to economic theories of sustainability. Mathematical proficiency with algebra is assumed. Students from all academic interests and experiences are welcome in the course. QR, SC, SO 0 Course cr

HUMS 1210b / ANTH 1200b / NELC 1200b, Unequal: Dynamics of Power and Social Hierarchy in Ancient Egypt and Mesopotamia Gojko Barjamovic
The course "Unequal" examines the historical roots of intolerance, slavery, and imperialism, emphasizing how our perceptions of history shape contemporary beliefs and policies. It challenges the notion that inequality is an inevitable outcome of societal complexity, positing that historical narratives often frame progress and freedom while obscuring themes of inequality. By investigating early human history, the course aims to unpack the concepts of identity, possession, value, freedom, and power, exploring their impact on modern society. Rather than focusing on specific literature or chronological period, "Unequal" centers around critical questions about human culture. The course employs innovative experimental lab assignments, allowing students to engage with the past creatively, such as cooking ancient recipes, brewing beer, and creating virtual museum exhibits. This interdisciplinary approach encourages a deeper understanding of the historical context that informs present-day issues, inviting students to rethink common narratives and assumptions about equality and progress. Ultimately, the course aims to foster critical thinking about the interplay between history and contemporary society. HU, SO 0 Course cr

* **HUMS 1270a / CPLT 1680a / ENGL 1029a / TDPS 1005a, Tragedy in the European Literary Tradition** Shane Vogel
The genre of tragedy from its origins in ancient Greece and Rome through the European Renaissance to the present day. Themes of justice, religion, free will, family, gender, race, and dramaturgy. Works might include Aristotle's *Poetics* or Homer's *Iliad* and plays by Aeschylus, Sophocles, Euripides, Seneca, Hrotsvitha, Shakespeare, Lope de Vega, Calderon, Racine, Büchner, Ibsen, Strindberg, Chekhov, Wedekind, Synge, Lorca, Brecht, Beckett, Soyinka, Tarell Alvin McCraney, and Lynn Nottage. Focus on textual analysis and on developing the craft of persuasive argument through writing. Formerly ENGL 129. WR, HU

* **HUMS 1280a / CPLT 2000a / NELC 1280a, From Gilgamesh to Persepolis: Introduction to Near Eastern Literatures** Kathryn Slanski
This course is an introduction to Near Eastern civilization through its rich and diverse literary cultures. We read and discuss ancient works, such as the *Epic of Gilgamesh*, *Genesis*, and "The Song of Songs," medieval works, such as *A Thousand and One Nights*, selections from the *Qur'an*, and *Shah-nama: The Book of Kings*, and modern works of Israeli, Turkish, and Iranian novelists and Palestinian poets. Students complement classroom studies with visits to the Yale Babylonian Collection and the Beinecke Rare Book and Manuscript Library, as well as with film screenings and guest speakers. Students also learn fundamentals of Near Eastern writing systems, and consider questions of tradition, transmission, and translation. All readings are in translation. Permission from the instructor required. WR, HU

HUMS 1315a / HSHM 2210a / RLST 1315a, What Was the University? Noreen Khawaja
A deep history of the university as a political, intellectual, and ritual institution. Focus on key chapters and cases in the university's formation, from the mutual-aid societies of medieval Europe to modern research institutions such as Yale. What conditions gave rise to the particular type of school we call a university? How have universities played a role in the development of modern society? How might the history of this institution help us understand its role at the center of politics today? HU o Course cr

* **HUMS 1320a / CPLT 1690a / ENGL 1030a, Epic in the European Literary Tradition** Craig Eklund
The epic tradition traced from its foundations in ancient Greece and Rome to the modern novel. The creation of cultural values and identities; exile and homecoming; the heroic in times of war and of peace; the role of the individual within society; memory and history; politics of gender, race, and religion. Works include Homer's *Odyssey,* Vergil's *Aeneid,* Dante's *Inferno,* Cervantes's *Don Quixote,* and Joyce's *Ulysses.* Focus on textual analysis and on developing the craft of persuasive argument through writing. Formerly ENGL 130. WR, HU

* **HUMS 1390a / MUSI 1137a, Western Philosophy in Four Operas 1600–1900** Gary Tomlinson
This course intensively studies four operas central to the western repertory, spanning the years from the early 17th to the late 19th century: Monteverdi's *Orfeo*, Mozart's *Don Giovanni*, Wagner's *Die Walküre* (from *The Ring of the Nibelungs*), and Verdi's *Simon Boccanegra*. The course explores the expression in these works of philosophical stances of their times on the human subject and human society, bringing to bear writings contemporary to them as well as from more recent times. Readings include works of Ficino, Descartes, Rousseau, Wollstonecraft, Schopenhauer, Kierkegaard, Douglass, Marx, Nietzsche, Freud, and Adorno. We discover that the expression of changing philosophical stances can be found not only in dramatic themes and the words sung, but in the changing natures of the musical styles deployed. HU

HUMS 1400a / NELC 1210a, The Hero in the Ancient Near East Kathryn Slanski
This course is an introduction to of ancient Near Eastern civilization through the prism of its heroes, figures at the intersection of literature, religion, history, and art. While our principle focus is on heroes from ancient Mesopotamia and the Hebrew Bible, students

will also have opportunities to compare contemporary heroes to the ANE hero, and to consider if the ANE hero has a modern legacy. WR, HU 0 Course cr

* **HUMS 1740b / ENGL 3474b / HIST 2705b, Writing from the Archive: Imagining the Real** Adina Hoffman

Where do the dry, who-what-which details set down on a census form meet the far messier and richer reality of the people whose names are scrawled there? And how might a writer bring that meeting about? What can a shoebox of doodle-filled letters tell us about the ways that friendship, art, war, sex, and politics struck a couple of New York novelists, c. 1941? How do we respond as writers and as a culture when faced with the lack of such inky particulars? Blending seminar and workshop, this class is meant for students who want to write literary non-fiction based on archival materials. In an intensive, hands-on fashion, we'll dig into documents of all sorts as we read essays and excerpts from belletristic works that wrestle with the sometimes slippery fact of the archive. Throughout, we'll ask how best to bring vital prose into being. Weekly writing experiments that draw from various Yale collections and beyond will encourage students to see and respond to archival discoveries freshly and for themselves. A semester-long writing project will take shape as an extension of that seeing and responding. While no previous archival experience is required, this class calls for a serious commitment to the written word. By permission of instructor. Limit 12. WR, HU

* **HUMS 1770a / CLCV 3340a / PLSC 306a / PLSC 3369a, Tragedy and Politics** Daniel Schillinger

The canonical Greek tragedians—Aeschylus, Sophocles, and Euripides—dramatize fundamental and discomfiting questions that are often sidelined by the philosophical tradition. In this seminar, we read plays about death, war, revenge, madness, impossible choices, calamitous errors, and the destruction of whole peoples. Aeschylus, Sophocles, and Euripides were also piercing observers of political life. No less than Plato and Aristotle, the Attic tragedians write to elicit reflection on the basic patterns of politics: democracy and tyranny, war and peace, the family and the city, the rule of law and violence. Finally, we also approach Greek tragedy through its reception. Aristophanes, Plato, Aristotle, and Nietzsche: all these thinkers responded to tragedy. Texts include Aeschylus, *Oresteia;* Aristophanes, *Frogs* and *Lysistrata*; Euripides, *Bacchae*, *Heracles*, and *Trojan Women*; Nietzsche, *The Birth of Tragedy*; Plato, *Symposium*; and Sophocles, *Antigone*, *Philoctetes*, and *Oedipus Tyrannus*. Previous work in political theory, classics, or philosophy is recommended. HU

* **HUMS 1840a / AMST 1184a / ENGL 2464a, Approaches to Contemporary Biography: Writing and Reading Biography** Karin Roffman

The art of biography explored through groundbreaking examples, with particular emphasis on contemporary texts that explore the lives and work of artists. Topics on biographical theory and practice include: the balance of life and work; the relationship between biographer and subject; creative approaches to archives and research; and imaginative narrative strategies. Some classes take place at the Beinecke Library and there are some visits by working biographers. Students must complete an original biographical project by the end of the semester. HU RP

* **HUMS 1850a / ENGL 3454a / HSAR 4460a, Writing about Contemporary Figurative Art** Margaret Spillane
A workshop on journalistic strategies for looking at and writing about contemporary paintings of the human figure. Practitioners and theorists of figurative painting; controversies, partisans, and opponents. Includes field trips to museums and galleries in New York City. WR, HU

* **HUMS 1997b / CPLT 3005b / ENGL 3415b / JDST 3843b, Advanced Literary Translation** Peter Cole
A sequel to LITR 348 or its equivalent, this course brings together advanced and seriously committed students of literary translation, especially (but not only) those who are doing translation-related senior theses. Students must apply to the class with a specific project in mind, that they have been developing or considering, and that they will present on a regular basis throughout the semester. Discussion of translations-in-progress are supplemented by short readings that include model works from the world of literary translation, among them introductions and pieces of criticism, as well as reflections by practitioners treating all phases of their art. The class is open to undergraduates and graduate students who have taken at least one translation workshop. By permission of the instructor. Formerly ENGL 483. Prerequisite: LITR 348.

* **HUMS 2000a / CPLT 1950a / ENGL 3505a / MUSI 4362a, Medieval Songlines** Ardis Butterfield
Introduction to medieval song in England via modern poetic theory, material culture, affect theory, and sound studies. Song is studied through foregrounding music as well as words, words as well as music. WR, HU

* **HUMS 2035b / HIST 2635b, Antisemitism and its opponents in the Muslim world** Staff
Antisemitism, as well as opposition to it, has long been a part of social, political, and intellectual life in Muslim-majority societies. These societies have also long included significant Jewish minorities, especially before the foundation of the State of Israel in 1948. This course takes a historical approach, carefully examining antisemitisms of various types in various periods as well as opposition to them by Jews, Muslims, and others in the Islamicate world. HU

* **HUMS 2228a / CPLT 3450a / EVST 2228a / HIST 1759a, Climate Change and the Humanities** Katja Lindskog
What can the Humanities tell us about climate change? The Humanities help us to better understand the relationship between everyday individual experience, and our rapidly changing natural world. To that end, students read literary, political, historical, and religious texts to better understand how individuals both depend on, and struggle against, the natural environment in order to survive. HU

HUMS 2501a / CLCV 2501a / HIST 1217a, The Roman Republic Staff
The origins, development, and expansion of Rome from the earliest times to the deaths of Caesar and Cicero. Cultural identity and interaction; slavery, class, and the family; politics, rhetoric, and propaganda; religion; imperialism; monumentality and memory; and the perception and writing of history. Application of literary and archaeological evidence. HU o Course cr

* **HUMS 2530a / ENGL 3846a / RLST 2330a, Poetry and Faith** Christian Wiman
Issues of faith examined through poetry, with a focus on modern poems from 1850 to the present. Poems from various faith traditions studied, as well as to secular and antireligious poetry. HU

* **HUMS 2555a / RLST 2555a, Metaphysical Fictions** Nancy Levene
This course takes up works that explore predicaments in historical and conceptual reality. At issue are world building, disruption, and alteration, perspective and time, relationship, interpretation, and varieties of threat and response. HU

* **HUMS 2631a / FILM 4270a / MUSI 4470a, Noise** Brian Kane
A study of noise from musical, philosophical, and cultural perspectives. Reading and discussion of theoretical, political, ecological, and avant-garde writings on noise; critical study of musical repertoire involving noise, sound art, and recorded sound; introduction to current debates in sound studies and auditory culture; hands-on work with electronic noise. WR, HU

HUMS 2720b / CPLT 2650b / EALL 2560b / EAST 2221b / GLBL 2251b, China in the World Jing Tsu
Recent headlines about China in the world, deciphered in both modern and historical contexts. Interpretation of new events and diverse texts through transnational connections. Topics include China's international relations and global footprint, language and script, Chinese America, science and technology, and science fiction. Special topic for AY 2025-2026 with guest speakers: AI, U.S.-China futurism, and tech policy Readings and discussion in English. HU 0 Course cr

* **HUMS 2740a / CPLT 3880a / NELC 3250a, The Education of Princes: Medieval Advice Literature of Rulership and Counsel** Shawkat Toorawa
In this course we read "mirrors for princes," a type of political writing by courtiers and advisors. The genre flourished in the courts of medieval Europe and the Islamic world. We learn about the ethical and moral considerations that guided (or were meant to guide) rulers in their conduct, in the formulation of their policies, and about theories of rule and rulership. The works we read are from several cultural, religious, and political traditions, and include: Christine de Pizan, *A Medieval Woman's Mirror of Honor*; Einhard, *Life of Charlemagne*; Erasmus, *Education of a Christian Prince*; Ibn al-Muqaffa', *Kalilah and Dimnah,* John of Salisbury, *Policraticus: Book of the Statesman*; Machiavelli, *The Prince*; Nizam al-Mulk, *The Book of Government.* All texts are in English translation. Instructor permission is required. HU

* **HUMS 2790a / HIST 3292a / PLSC 3313a, Democracy and the French Revolution** Isaac Nakhimovsky
The French Revolution of 1789 and its legacies, as viewed through the late-eighteenth-century debates about democracy, equality, representative government, and historical change that shaped an enduring agenda for historical and political thought in Europe and around the world. WR, HU

HUMS 2800a, What Matters Most Staff
"What is a good life?" is a daunting question. While each of us needs to answer it, it is almost impossible to do so all at once. This course divides the question of the good life into smaller, but still very significant questions, like: Who do we answer to for the shape of our lives? What should we hope for? What is the role of suffering in a good life? Readings and discussion-heavy lectures engage a number of ancient and

contemporary voices from a variety of religious, philosophical, ideological, and cultural perspectives. Through a series of small writing assignments, students respond to each of life's big questions for themselves and synthesize these responses into their own account of what matters and why. WR, HU o Course cr

* **HUMS 2900a / CPLT 2180a / RSEE 2090a, Medicine and the Humanities: Certainty and Unknowing** Matthew Morrison

Sherwin Nuland often referred to medicine as "the Uncertain Art." In this course, we address the role of uncertainty in medicine, and the role that narrative plays in capturing that uncertainty. We focus our efforts on major authors and texts that define the modern medical humanities, with primary readings by Mikhail Bulgakov, Henry Marsh, Atul Gawande, and Lisa Sanders. Other topics include the philosophy of science (with a focus on Karl Popper), rationalism and romanticism (William James), and epistemology and scientism (Wittgenstein). Events permitting, field trips will take us to the Yale Medical Historical Library, the Yale Center for British Art, the Peabody Museum, and the Marsh Botanical Garden. HU

* **HUMS 3061a / CPLT 3065a / GMAN 3060a, Bad Books** Kirk Wetters

Traditional humanities education always focused on "greatness"–but there is no denying the critical value and sometimes even the enjoyment of poor performances. In a world governed by norms and standards (against the appearance of laxness and relativism), "badness" and amateurism are inevitable. "Bad" works can be extremely popular and influential (e.g., in the cases of pseudoscience, misinformation, racism, antisemitism). The "bad" archive contributes to a reevaluation of critical standards, forms of official and unofficial censorship, freedom of speech and the function of taboos. The course explores famous works that have been considered aesthetically, morally, ideologically and politically pernicious (stopping short, however, of screeds and manifestos like Hitler's *Mein Kampf*). Nevertheless, this course warrants a strong content warning. The range of our considerations will be partly based on the students' wishes and judgments. HU

* **HUMS 3188a / CPLT 3180a / FILM 2827a / GMAN 3180a, Artificial Life: (Re)Production and the Limits of Humanity** Austen Hinkley

A mad scientist creates a living being in a laboratory; automata band together to overthrow their creators; a moving statue appears more lifelike than a human being. Such fantastical images and stories of artificial humanity haunt human culture, from ancient myths to contemporary media. This seminar explores such imaginations of the artificially human, with an emphasis on their role within German culture, in order to examine the often-hazy boundary between artificial production and organic reproduction. We will discuss the significance of this boundary for our understanding of topics such as literature, art, labor, gender, and psychology. Readings are drawn from sources both ancient and modern, from discourses including religion, philosophy, alchemy, literature, and psychoanalysis. In addition to readings, film and other visual materials will be incorporated as primary texts. HU

* **HUMS 3304a / AMST 3304a / ANTH 3304a / ER&M 3304a / SOCY 3104a, Ethnography & Journalism** Madiha Tahir

While each is loathed to admit it, journalism and ethnography are cousins in some respects interested in (albeit distinct) modes of storytelling, translation, and interpretation. This methods course considers these shared grounds to launch a cross-comparative examination. What can the practies of each field and method—journalism

and ethnography—tell us about the other? How do journalists and ethnographers engage ideas about the truth? What can they learn from each other? Students spend the first four weeks studying journalistic methods and debates before shifting to ethnographic discussions, and finally, comparative approaches to writing; data and evidence; experience and positionality. HU, SO

* **HUMS 3371a / PHIL 3371a / PLSC 3371a, Machiavelli and Machiavellianism** Steven Smith

It is generally agreed that modern political science begins with Machiavelli, but what that means remains a subject of considerable dispute. What were Machiavelli's accomplishments? Was he a political realist who taught us to seek for "the effectual truth" of things? Was he an advisor to princes or, at the very least, powerful executives who taught the importance of acting by "oneself alone"? Was he a populist who sought to reanimate a taste for Roman-style republicanism? Or did he seek to bring about a new kind of expansive territorial state fuelled by war and the desire for empire? Machiavelli's influence has been widespread throughout the modern world. But just because his writings have been used and misused for a range of causes does not mean that we cannot discover an intelligible and coherent core to his work. We read Machiavelli's two most important works of political theory—the *Prince* and the *Discourses on Livy*. The latter is read along with the Roman historian Titus Livy who was Machiavelli's major source for his theories of political conflict, leadership, and liberty. We then consider his influence on some selected nineteenth and twentieth-century political theorists who have appropriated him as the central figure of modernity. Throughout the course we are attentive to the interpretive and methodological issues at stake in the recovery of the thought of this great Florentine political thinker. SO

* **HUMS 3372a / EDST 1372a / PLSC 3372a, Idolizing Education** Mordechai Levy-Eichel

What is learning? What is education? And why is it so easy to ask, yet so damn hard to answer these questions? Is there something wrong with these queries, with the assumptions we have about them—and what assumptions are those, anyways? This course will be an examination of the history, sociology, politics, and philosophy of education, as well as a critical examination of the scholarly study of education. Although there has probably never been more research into learning and schools, our presuppositions about what education should be have, in fact, narrowed and hardened. This course aims both to break and to refresh them. Examples will range chronologically from ancient to modern times, and will be taken from a broad range of traditions and institutions. Particular attention will be paid to the origins and growth of the research university, and the costs and benefits involved in the modern institutionalization of learning. We will focus on—in the words of a noted, but now neglected Yale psychologist (Seymour Sarason)—how education has, especially in modern western societies like ours, become both "scapegoat and salvation."

* **HUMS 3386a / HSAR 4405a / ITAL 3386a, The Dark Side of The Italian Renaissance: Sex, Scandals, and Secrets** Simona Lorenzini and Deborah Pellegrino

The course explores the more controversial, hidden, and overlooked aspects of the Italian Renaissance. While this period is celebrated for its artistic, cultural, and intellectual achievements, it also had its fair share of intrigue, corruption, and moral complexities. Through love poems, secret letters, intricate networks, and political

conspiracies, the course paints a vivid picture of the social and cultural landscape of Renaissance and early modern Italy. We look at the complex figure of Michelangelo, both as an artist and poet, focusing on his queer relationship with Tommaso de' Cavalieri and his friendship with Vittoria Colonna. We then discuss how Renaissance art, often commissioned by powerful individuals—such as Isabella D'Este's patronage of Leonardo da Vinci—was used to promote political or social agendas. We examine the alliances, betrayals, and murders that took place in Renaissance courts and how they shaped the political arena. Topics include the assassination of Lorenzo de' Medici's brother, Caterina de' Medici's agency, and Borgia's rise to power as well as the use of poison as a political instrument in power struggles and schemes to eliminate rivals. The course highlights radical and sharp-witted women writers, such as Moderata Fonte and Arcangela Tarabotti, who protested against a patriarchal society, and gave voice to those who challenged gender norms. By uncovering these compelling narratives through the intersection of literature, religion, history, art, and sexuality, the course offers a more nuanced and critical view on this acclaimed era. This course counts as language across the curriculum (LxC). HU

* **HUMS 3401a / CPLT 3401a / RSEE 3401a / RUSS 3401a, The Stranger: Travel and Belonging Across Empires** Jinyi Chu and Hana Stankova

How has the "stranger" shaped national and imperial identities? This course considers travel and emigration in imperial contexts and brings Russian literature into conversation with European literature. We explore narratives of imperial exceptionalism, Russian parochialism, and the broader imperial contexts that shaped the world in the 19th and 20th centuries. Through a literary journey from the late 18th century to the mid 20th century, students consider how the Russian literary tradition and national identity were shaped by fraught exchanges between Russians and Western Europeans, as well as by Russia's expansion eastward. We read canonical works by writers who questioned or supported empires and think through ways in which they influenced one another. Through close readings, historicization, and theorization, students gain new perspectives on the issues of belonging and alienation in changing imperial contexts. WR, HU

* **HUMS 3466a / AMST 3334a / CPLT 3500a / FILM 3540a / GMAN 3460a, Uwe Johnson's Anniversaries: From A Year in the Life of Gesine Cresspahl** Austen Hinkley

Uwe Johnson's *Anniversaries: From A Year in the Life of Gesine Cresspahl* remains a monument of postwar German literature—and it was written in and about New York City. Across its 367 short chapters (each corresponding to a day of the year), the novel unfolds on three levels: the historical present in New York, memories and family history from Germany, and reporting from the New York Times on current events. The result is a view of life, politics, and history in the middle of the 20th century that is as rich and expansive as it is fragmented. The social and political climate of New York in the late '60s is put into contact with memories of the rise of Nazism in Germany; reporting on the Vietnam war, the civil rights movement and the Prague Spring is refracted through the lenses of the protagonist's past life in East Germany and her new life raising her daughter alone in New York. This course undertakes a close reading of Johnson's sprawling novel with attention to its many historical, political, and literary contexts. Readings from the novel are complemented by relevant short readings on

theories of media, politics, literature, and history. No prior knowledge of German language and literature is required.
HU

* **HUMS 3475b / FILM 3740b, Media and Protection** Francesco Casetti
Alarm systems safeguard private homes; passwords filter access to websites; digital watches monitor vital signs; *x*-rays scan passengers in airport terminals; locked doors requiring IDs isolate sensitive sites; GPS helps escape traffic jams; weather forecasts warn how to avoid impending disasters; whistleblowing platforms stop wrongdoing; online entertainment offers respite from external pressures; and social networks allow online exchanges between individuals who want to bypass physical interactions. A full range of media provide protection against what appears to be a threatening milieu. However, protection has a cost in terms of values and habits. It requires identifying and even materializing a threat and an enemy; it implies a step back from the direct experience of reality and others; and ultimately it idealizes a safe world. But is the world ready to be safe? Is the enemy a necessary invention? Is security guaranteed to all? And ultimately, is protection the only remedy for our fears? This seminar addresses such questions. HU

* **HUMS 3720b / CPLT 4890b / GMAN 3620b, Critique and Crisis** Kirk Wetters
In our time, when everyone is suspected of being hyper-critical, it is not surprising that the limits of critique, its function and institutional location are called to question. The idea of "post-critique" has been much discussed in recent year. In order to gain orientation with respect to such concerns, this course develops critical models, primarily from the German tradition, in order to show the great variety of options available beyond the “hermeneutics of suspicion.” Topics include: post-critique, the history of critique/criticism, the Romantic concept of critique, traditional vs. critical theory, historicism, philology vs. hermeneutics, science (Wissenschaft) vs. the critique of positivism. Main protagonists include Kant, Schiller, Schlegel, Nietzsche, Dilthey, Max Weber, Lukács, Husserl, Benjamin, Adorno, Koselleck, Szondi, Gadamer, Gumbrecht, Latour, Felski. HU

* **HUMS 3800a / CPLT 1540a / ENGL 3195a, The Bible as a Literature** Leslie Brisman
Study of the Bible as a literature—a collection of works exhibiting a variety of attitudes toward the conflicting claims of tradition and originality, historicity and literariness.
WR, HU RP

* **HUMS 4144a, Love, Marriage, Family: A Psychological Study through the Arts** Ellen Handler Spitz and R Howard Bloch
A psychological study of love, marriage, and family through literature, visual arts, and music, from the ancient world to mid-century America. An over-arching theme is the protean human potential for adaptation, innovation, and creativity by which couples and families struggle to thrive in the face of opposing forces, both internal and external. In this seminar, we study these themes not only as they have been treated in different parts of the world at different times, but also the means offered by each of the arts for their portrayal. HU

* **HUMS 4145a / ENGL 2145a / FILM 4220a, The Aesthetics of Adaptation** Katja Lindskog
Adaptations of literary texts are the bread and butter of visual narrative media like TV and film. Adaptations of certain authors and texts have given rise to entire sub-genres

and cottage industries. We consider what adaptations of literary texts, particularly very famous and beloved texts, might help us understand better about the texts themselves, and about the needs and expectations of the audiences of their adaptations. To that purpose, this course explores the purposes and effects of adaptation through a study of a variety of screen versions of adapted texts by authors including Jane Austen, Emily St. John Mandel, and Geoffrey Chaucer. Assigned readings include both literary texts and screen adaptations. HU

HUMS 4163a, AI as Global Cultural Artifact Sayan Bhattacharyya
The course seeks to help develop an understanding of how Artificial Intelligence has been imagined, in global culture, by writers and artists hailing from, or affiliating with, various parts of the globe; and also how, to some extent, human cultural imagination and demands have influenced developments in AI. We address these questions in a global sense as much as we can: while the culture of Western modernity will figure very prominently in the readings and discussion, we take a more enlarged perspective, with some of the readings being about, and/or from, places and imaginaries beyond the West: China, Afrofuturism, and South Asia. Readings consist mostly of imaginative literary works (short stories, and excerpts from longer novels), but also encompasses some non-fiction and graphic fiction. At least two weeks of class also focuses on non-textual culture (theater, film, paintings, and music that is connected to AI). The readings combine with assignments involving both traditional essays (midterm essay and final essay) and short assignments (assigned on a rolling basis, which let students explore the questions addressed in the course to a further extent). HU

* **HUMS 4165a, Culture and Artificial Intelligence** Sayan Bhattacharyya
The world is currently rife with talk of a fourth industrial revolution, which is supposedly being inaugurated by recent developments in Artificial Intelligence (AI). What might an AI-induced shift in how we manipulate information, generate sound, create visual art (both still and moving images), and tell stories signify in the realm of culture, and what might it portend for our sense of who we are in the world? How should we situate AI, when viewed through the lens of culture at large, within the story of modernity? While the recent uproar concerning large language models (LLMs) in AI is only two years old, AI as a field has, however, existed for almost seventy years now. This course looks at AI and explore its relation with culture in a threefold way: through (i) *historicizing* (by looking at the historical cultural conditions that enabled or facilitated certain habits of thought or régimes of truth that led to present-day AI); (ii) *analogizing* (by tracing the similarities between patterns of expression in culture and developments in AI); and (iii) *contextualizing* (tracing how cultural artifacts have influenced AI's directions and vice versa). The course's orientation towards AI is critical, interpretive and analytical. HU

* **HUMS 4183a / HSHM 4640a, Nature and Human Nature** Gary Tomlinson
This course explores the Western conception of the human place in the natural world as it has shifted across four centuries. It features, alongside corollary readings, close study of three classic texts: Galileo's *Dialogue Concerning the Two Chief World Systems* (1632), Giambattista Vico's *New Science* (1744), and Darwin's *Origin of Species* (1859)#fundamental texts locating humans in the cosmos, in society, and in natural history, respectively. It finishes with a new work, Terrence Deacon's *Incomplete Nature* (2011), an attempt to explain the emergence of mind from the natural world.

No prerequisites, though the challenging nature of the materials suggests that this course will be aimed mainly at students beyond their first year. HU

*** HUMS 4320a / CPLT 2190a / ENGL 2821a, The Waste Land** Paul Grimstad
The seminar looks closely at the most influential poem of the 20th century, T.S. Eliot's "The Waste Land." Attention to the poem both as a work of radical modernist experiment and as carrying on a kaleidoscopic dialogue with world literature. Taking our cue from the notes Eliot added to the poem we read selections from the Buddha's Fire Sermon, the Upanishads, versions of the Holy Grail myth, Dante's Inferno, The Tempest, Charles Baudelaire's Fleurs du mal, and F.H. Bradley's Appearance and Reality. Further reading includes Eliot's earlier poetry, especially "The Love Song of J. Alfred Prufrock," and his own criticism of the period, including "Tradition and the Individual Talent," "The Metaphysical Poets," and "Ulysses, Order and Myth." We also consider critical appraisals of the poem by Virginia Woolf, F.R. Leavis and Ralph Ellison, be attentive to comparable aesthetic innovations of the period in painting and music (cubism, Stravinsky's Le sacre du printemps, ragtime), and listen to audio recordings of Eliot (and others) reading the poem. Meditation throughout on the poem as a collage of allusions forming a complex work of art. At least one course that involves close reading literary prose or poetry. WR, HU

*** HUMS 4333a / GMAN 3333a, Kafka** Paul North
A name, a puzzle to be solved, a mirage-like figure provoking writers like Jorge Luis Borges to step beyond staid literary models, Jew, German, subject of the Kingdom of Bohemia, accident insurance lawyer, inventor of a device to make table saws safe, abject sufferer of tuberculosis, critic of philosophy and European culture, misogynist, queer, dreamer and recorder of dreams, jokester, refuter of Kierkegaard, challenger to Nietzsche, fabulist, reader of Freud, reader of Flaubert, reader of..., writer of short prose pieces "in a single breath," diarist, novelist. Kafka. HU

*** HUMS 4344a / ENGL 4733a, Henry James** Ruth Yeazell
Selected novels by Henry James, from *Roderick Hudson* through *The Golden Bowl*. Particular attention to the international theme and to the ways in which James's later novels revisit and transform the matter of his earlier ones. WR, HU

*** HUMS 4363a / ENGL 3714a, Moby-Dick** John Peters
This seminar engages in the interpretation of a single great book, *Moby-Dick* (1851) by Herman Melville. We also read some of Melville's most relevant earlier and later works, and pay attention to the book's historical, literary, artistic, religious, economic, environmental, and technological contexts. Field trips to whaling-relevant sites possible. WR, HU

*** HUMS 4430a / HIST 3232a / JDST 3270a / MMES 3342a / RLST 2010a, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus
How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

HUMS 4501a / PHIL 1118a / RLST 1270a / SAST 2610a, Buddhist Thought: The Foundations Staff
This class introduces the fundamentals of Buddhist thought, focusing on the foundational doctrinal, philosophical, and ethical ideas that have animated the Buddhist tradition from its earliest days in India 2500 years ago down to the present, in places such as Tibet, China, and Japan. Though there will be occasional discussion of the social and practical contexts of the Buddhist religion, the primary focus of this course lies on how traditional Buddhist thinkers conceptualize the universe, think about the nature of human beings, and propose that people should live their lives. Our main objects of inquiry are therefore the foundational Buddhist ideas, and the classic texts in which those ideas are put forth and defended, that are broadly speaking shared by all traditions of Buddhism. In the later part of the course, we take up some of these issues in the context of specific, regional forms of Buddhism, and watch some films that provide glimpses of Buddhist religious life on the ground. HU 0 Course cr

HUMS 4527a / CHNS 2000a / EALL 2000a / EAST 2202a, The Chinese Tradition Staff
An introduction to the literature, culture, and thought of premodern China, from the beginnings of the written record to the turn of the twentieth century. Close study of textual and visual primary sources, with attention to their historical and cultural backdrops. Students enrolled in CHNS 200 join a weekly Mandarin-language discussion section. No knowledge of Chinese required for students enrolled in EALL 200. Students enrolled in CHNS 200 must have L5 proficiency in Mandarin or permission of the course instructor. HU 0 Course cr

HUMS 4570a / HSAR 1170a / HSHM 2240a, Nature and Art, or The History of Almost Everything Staff
This global introductory course surveys the interrelation of nature and art from antiquity to the present. Throughout the semester, we consider a controversial question: is it possible to understand the history of art and science as a more-than-human story? Challenging traditional narratives of human progress, we attend to episodes of invention and destruction in equal measure. We discuss how art history is inseparable from histories of extracted resources, exploited species, environmental catastrophe, racialized and gendered understandings of the 'natural' and 'unnatural', and politicized understandings of land as power. At the same time, we explore how makers across cultures approached the natural world as a locus of the divine, a source of inspiration, and the ground for both scientific inquiry and the pursuit of self-knowledge. The very notions of art and artistic creation are impossible to define without recourse to nature as both a concept and a site of lived experience. This course is open to all, including those with no prior background in art history. Sections will include visits to collections and sites across Yale campus. HU 0 Course cr

* **HUMS 4710a, Special Studies in the Humanities** Paul Grimstad
For students who wish to pursue a topic in Humanities not otherwise covered. May be used for research or for directed reading under the guidance of one or more faculty advisers. In either case a term paper or its equivalent is required, as are regular meetings with the adviser or advisers. To apply, a student should present a prospectus and a bibliography signed by the adviser or advisers to the director of undergraduate studies. Enrollment limited to juniors and seniors majoring in Humanities.

* **HUMS 4910a, The Senior Essay** Paul Grimstad
Independent library-based research under faculty supervision. To register, students must consult the director of undergraduate studies no later than the end of registration period in the previous term. A written plan of study approved by a faculty adviser must be submitted to the director of undergraduate studies. RP

Hungarian (HGRN)

Indonesian (INDN)

INDN 1100a, Elementary Indonesian I Indriyo Sukmono
An introductory course in standard Indonesian with emphasis on developing communicative skills through a systematic survey of grammar and graded exercises. Enrollment limited to 15 per section. L1 1½ Course cr

INDN 1200b, Elementary Indonesian II Indriyo Sukmono
Continuation of INDN 110. Introduction to reading, leading to mastery of language patterns, essential vocabulary, and basic cultural competence. After INDN 110 or equivalent. Enrollment limited to 15 per section. L2 1½ Course cr

* **INDN 1300a, Intermediate Indonesian I** Dinny Aletheiani
Continued practice in colloquial Indonesian conversation and reading and discussion of texts. After INDN 120 or equivalent. Limited enrollment. L3 1½ Course cr

* **INDN 1400b, Intermediate Indonesian II** Dinny Aletheiani
Continuation of INDN 130. After INDN 130 or equivalent. Limited enrollment. L4 1½ Course cr

* **INDN 1500a, Advanced Indonesian I** Indriyo Sukmono
Development of advanced fluency through discussion of original Indonesian sociohistorical, political, and literary texts and audiovisual sources. Extension of cultural understanding of Indonesia. Prerequisite: INDN 140 or equivalent. May not be taken after INDN 153. L5

* **INDN 1700a, Advanced Indonesian: Special Topics** Dinny Aletheiani Continuation of INDN 160. Students advance their communicative competence in listening, speaking, reading, and writing. Use of Indonesian book chapters, Web pages, printed and electronic articles, social networking posts, newsgroups, and letters. Prerequisite: INDN 160. L5

* **INDN 1800b, Research and Creative Project on Indonesia** Dinny Aletheiani
Continuation of INDN 170. Advancement in students' competence in listening, speaking, reading, and writing. Reading materials include book chapters, Web sites, print and electronic articles, e-mail messages, blogs, and social networking posts. Prerequisite: INDN 170. L5

* **INDN 4700a, Independent Tutorial** Dinny Aletheiani
For students with advanced Indonesian language skills who wish to engage in concentrated reading and research on material not otherwise offered in courses. The work must be supervised by an adviser and must terminate in a term paper or its equivalent. After INDN 160. Permission to enroll requires submission of a detailed project proposal and its approval by the program adviser.

Italian Studies (ITAL)

*** ITAL 0030a / HUMS 0204a, Six Global Perspectives on Knights** Alessandro Giammei

What do Batman (the Dark Knight) and Orlando (Charlemagne's wise paladin) have in common? What is the thread that connects the Jedi knights of *Star Wars* and those that sat around king Arthur's round table? How did medieval history and Renaissance poetry inform the expanded universes of superhero movies and fantasy literature, along with the inexhaustible fan-fiction that further extends and queers them? Chivalry, as a code of conduct and a network of symbols, inspired some of the most entertaining stories of the so-called Western canon, blurring the divide between high and popular culture. It offered storytellers (and nerds) of all ages a set of norms to question, bend, and break—especially in terms of gender. It challenged the very format of books, re-defining for good concepts like literary irony, seriality, and intermediality. This seminar proposes six pretty good trans-historical archetipes of fictional knights, combining iconic figures such as Marvel's Iron Man and Italo Calvino's Agilulfo, Ludovico Ariosto's Bradamante and *Game of Thrones'* Brienne of Tarth, Don Quixote and the Mandalorian. By analyzing together their oaths, weapons, armors, and destinies we aim to develop reading and writing skills to tackle any text, from epic and scholarship to TV-shows and comic-books. Enrollment limited to first-year students. Students enroll concurrently with HUMS 0299, Six Global Perspectives Lab. WR, HU 0 Course cr

*** ITAL 1100a, Elementary Italian I** Staff

A beginning course with extensive practice in speaking, reading, writing, and listening and a thorough introduction to Italian grammar. Activities include group and pairs work, role-playing, and conversation. Introduction to Italian culture through readings and films. Conducted in Italian. L1 1½ Course cr

*** ITAL 1300a, Intermediate Italian I** Staff

The first half of a two-term sequence designed to increase students' proficiency in the four language skills and advanced grammar concepts. Authentic readings paired with contemporary films. In-class group and pairs activities, role-playing, and conversation. Admits to ITAL 140. Conducted in Italian. ITAL 120 or equivalent. L3 1½ Course cr

ITAL 1310a / CPLT 1830a / HUMS 180, Dante in Translation Staff

A critical reading of Dante's *Divine Comedy* and selections from the minor works, with an attempt to place Dante's work in the intellectual and social context of the late Middle Ages by relating literature to philosophical, theological, and political concerns. No knowledge of Italian required. Course conducted in English. HU 0 Course cr

ITAL 1315b / HIST 1280b / RLST 1600b, The Catholic Intellectual Tradition Carlos Eire

Introductory survey of the interaction between Catholicism and Western culture from the first century to the present, with a focus on pivotal moments and crucial developments that defined both traditions. Key beliefs, rites, and customs of the Roman Catholic Church, and the ways in which they have found expression; interaction between Catholics and the institution of the Church; Catholicism in its cultural and sociopolitical matrices. Close reading of primary sources. HU 0 Course cr

* **ITAL 1316a, Science and Fiction in Modern Italy** Pierpaolo Antonello
This course explores the diverse ways in which science has been represented, conceptualized, questioned, and reimagined in 20th-century Italian fiction. We will examine how science functions both as a form of modern myth-making and as a mode of experience with profound cognitive and ethical dimensions. Often marked by irony and whimsy, the narratives we study engage with imagined technological futures, portrayals of the posthuman, and the ethical responsibilities of scientists. These literary works are exemplary in the way they define the multifaceted relationship between science and literature, resulting in innovative and influential experiments in narrative form. Our discussion will include critical texts by authors such as Italo Svevo, Dino Buzzati, Italo Calvino, Primo Levi, Leonardo Sciascia, and Daniele Del Giudice. The course will be conducted in English, and all required texts are available in English translation.

ITAL 1500a, Advanced Composition and Conversation: Staff
Discussion of social, political, and literary issues in order to improve active command of the language. Development of advanced reading skills through magazine and newspaper articles, essays, short stories, films, and a novel; enhancement of writing skills through experiments with reviews, essays, creative writing, and business and informal Italian. Classroom emphasis on advanced speaking skills and vocabulary building. Prerequisite: ITAL 140 or equivalent. L5

* **ITAL 3386a / HSAR 4405a / HUMS 3386a, The Dark Side of The Italian Renaissance: Sex, Scandals, and Secrets** Simona Lorenzini and Deborah Pellegrino
The course explores the more controversial, hidden, and overlooked aspects of the Italian Renaissance. While this period is celebrated for its artistic, cultural, and intellectual achievements, it also had its fair share of intrigue, corruption, and moral complexities. Through love poems, secret letters, intricate networks, and political conspiracies, the course paints a vivid picture of the social and cultural landscape of Renaissance and early modern Italy. We look at the complex figure of Michelangelo, both as an artist and poet, focusing on his queer relationship with Tommaso de' Cavalieri and his friendship with Vittoria Colonna. We then discuss how Renaissance art, often commissioned by powerful individuals–such as Isabella D'Este's patronage of Leonardo da Vinci–was used to promote political or social agendas. We examine the alliances, betrayals, and murders that took place in Renaissance courts and how they shaped the political arena. Topics include the assassination of Lorenzo de' Medici's brother, Caterina de' Medici's agency, and Borgia's rise to power as well as the use of poison as a political instrument in power struggles and schemes to eliminate rivals. The course highlights radical and sharp-witted women writers, such as Moderata Fonte and Arcangela Tarabotti, who protested against a patriarchal society, and gave voice to those who challenged gender norms. By uncovering these compelling narratives through the intersection of literature, religion, history, art, and sexuality, the course offers a more nuanced and critical view on this acclaimed era. This course counts as language across the curriculum (LxC). HU

* **ITAL 3387a / HIST 3265a / RLST 3145a, Francis of Assisi and His Legacy** Carlos Eire
Francis of Assisi is undoubtedly one of the most important figures in European history. As one of Catholicism's most revered saints (often considered to be the greatest

male saint ever), his radical message of voluntary poverty, humility and fraternity significantly revived the Catholic church in a moment of profound crisis, and has since been accepted as one of the foundational elements of European thought, receiving universal admiration from diverse thinkers who are often unaffiliated with the Catholic tradition. This course seeks to take both challenges head on. Its pedagogical intent is three-fold. First, by offering a comprehensive overview of the layered accumulation of narratives that has given us the Francis figure so beloved today, it encourages students to examine the ambiguous boundaries of "reliability" with regard to historical narratives, especially those with a mythopoetic flavor. Other than the well-known "Little Flowers", students are also exposed to less-known "lives" of the saint and are expected to critically compare these sources. Second, students are invited to Socratically wrestle with Francis' spiritual legacy in light of its obvious conflict with prevalent notions of the "good life" in contemporary America. Third, students will gain a robust understanding of the Franciscan tradition which has left its footprint in vast regions outside of Europe (Jerusalem, East Asia, the Americas), has generated an important school of theology, and continues to stoke prominent public debates through controversial modern figures such as Padre Pio. Background readings on medieval religious history will also be provided. Topics will include orthodoxy and heresy, factional conflict within religious orders, missionary activities, mysticism, female religious life, and faith and the visual arts. L4, HU

*** ITAL 3460a / MUSI 4300a, The Castrato** Jessica Peritz
This seminar locates the intriguing, anxiety-inducing figure of the castrato at the nexus of fact and fiction, working to disentangle the historical realities of castrato lives from fantasies (both popular and scholarly) about castrato bodies, voices, and sexualities. Though the practice of castration has a long and complicated global history, the Italian term *castrato* denotes a particular group of people within that history: the many thousands of Italian boys, mostly from poor families, who were subjected to surgery between 1550 and 1850 with the express purpose of altering their voices for music-making. As the most celebrated performers of vocal music in early modern Europe, castrati were adored, worshipped, and heaped with wealth—but also mocked, shunned, and denied basic human rights. These and other contradictions characterize the castrato's fraught place within music history, while also resonating across time with twenty-first-century concerns about constructions of gender, sexuality, race, class, and (dis)ability. HU

*** ITAL 4157a, Italian through Opera and Film** Anna Iacovella
Exploration of opera and contemporary Italian film to improve Italian grammar and conversational skills. Exercises include performances and presentations. Works include the operas *La Bohème, Otello,* and *I pagliacci*. L5, HU

*** ITAL 4162a, Introduction to Italian Literature: From the Duecento to the Renaissance** Simona Lorenzini
This is the first course in a sequence studying Italian Literature. The course aims to provide an introduction and a broad overview of Italian literature and culture from the Duecento to the Renaissance, specifically focusing on authors such as Dante, Petrarch, Boccaccio, Machiavelli, Ariosto, and literary and artistic movements such as Humanism and Renaissance. These authors and their masterpieces are introduced through readings, works of art, listening materials, videos, and films. Great space is left for in-class discussion and suggestions from students who may take an interest

in specific authors or subjects. This course is interactive and open, and the authors mentioned here are only indicative of the path that we follow. At the end of the course, students are able to analyze and critique literary works of different genres and time periods. The course is conducted in Italian. Prerequisite: ITAL 140 or equivalent. L5, HU

* **ITAL 4305a / FILM 3057a, Italian Film Ecologies: Yesterday, Today, and Tomorrow** Millicent Marcus

Landscape and the natural environment have never occupied "background" status in Italian film. Given the spectacular visual presence of its terrain—thanks to the relative proximity of mountain chains and the long seacoast—and given the pivotal importance of farming and pasturage in this traditionally agrarian economy, the synergy between the human and natural worlds has played a prominent role in Italian filmmaking since the very inception of the industry. Most recently, two developments have pushed this issue to the forefront of scholarly attention: the advent of ecocriticism, which found one of its earliest and most influential champions in Serenella Iovino, and the establishment of regional film commissions, grassroots production centers that sponsored cinematic works attuned to the specificity of "the local." The course includes study of films that predate our current environmental consciousness, as well as recent films that foreground it in narrative terms. In the case of the older films, which have already attracted a great deal of critical commentary over time, we work to shift our interpretive frame in an "eco-friendly" direction (even when the films' characters are hardly friends of the environment). Among the films considered are *Le quattro volte, Il vento fa il suo giro, L'uomo che verrà, Gomorra, L'albero degli zoccoli, Riso amaro, Red Desert*, *Christ Stopped at Eboli,* and *Il ladro di bambini*. We screen one film a week and devote our seminars to close analysis of the works in question. HU

Japanese (JAPN)

* **JAPN 1100a, Elementary Japanese I** Staff

Introductory course for students with no previous background in Japanese. Development of proficiency in listening, speaking, reading, and writing, including hiragana, katakana, and kanji characters. Introduction to Japanese culture and society. Individual tutorial sessions to improve oral communication skills. L1 RP 1½ Course cr

* **JAPN 1300a, Intermediate Japanese I** Saori Nozaki

Continued development in both written and spoken Japanese. Aspects of Japanese culture, such as history, art, religion, and cuisine, explored through text, film, and animation. Online audio and visual aids facilitate listening, as well as the learning of grammar and kanji. Individual tutorial sessions improve conversational skills. After JAPN 120 or equivalent. L3 RP 1½ Course cr

* **JAPN 1500a, Advanced Japanese I** Mika Yamaguchi

Advanced language course that further develops proficiency in reading, writing, speaking, and listening of Japanese. Discussion topics include a variety of Japanese culture and society, such as food, religion, and pop-culture. Individual tutorial sessions to improve oral communication skills. After JAPN 140 or equivalent. L5 RP

* **JAPN 1560a, Advanced Japanese III** Hiroyo Nishimura
Close reading of modern Japanese writing on current affairs, social science, history, and literature. Development of speaking and writing skills in academic settings, including formal speeches, interviews, discussions, letters, e-mail, and expository writing. Interviews of and discussions with native speakers on current issues. Individual tutorial sessions provide speaking practice. After JAPN 151 or equivalent. L5 RP

* **JAPN 1700a, Introduction to Literary Japanese** Yoshitaka Yamamoto
Introduction to the grammar and style of the premodern literary language (*bungotai*). We read *Taketori monogatari* (The Tale of the Bamboo Cutter, ca. 909), the oldest surviving work of prose fiction in Japanese, with a view toward understanding how literary texts were created, preserved, and disseminated in premodern Japan and East Asia. Prerequisite: JAPN 1510 or equivalent.

* **JAPN 1710b, Readings in Literary Japanese** Yoshitaka Yamamoto
Close analytical reading of a selection of texts from the Nara through the Tokugawa periods: prose, poetry, and various genres. Introduction to *kanbun*. After JAPN 170 or equivalent. L5

Jewish Studies (JDST)

* **JDST 0035b / HIST 0623b / HUMS 0360b / RLST 0035b, Jerusalem: Judaism, Christianity, Islam** Sarit Kattan Gribetz
The Old City of Jerusalem is just 0.35 square miles large, about half the size of Yale's campus. Have you ever wondered what makes this tiny city so beloved to—and the object of continual strife for—Jews, Christians, and Muslims? Through engagement with a wide range of sources—including biblical lamentations, archeological excavations, qur'anic passages, exegetical materials, medieval pilgrim itineraries, legal documents, maps, poetry, art, architecture, and international political resolutions—students develop the historiographical tools and theoretical frameworks to study the history of one of the world's most enduringly important and bitterly contested cities. Students encounter persistent themes central to the identity of Jerusalem: geography and topography; exile, diaspora, and return; destruction and trauma; religious violence and war; practices of pilgrimage; social diversity; missionizing; the rise of nationalism; peace efforts; the ethics of storytelling; and the stakes of studying the past. Enrollment limited to first-year students. HU RP

JDST 764b / HIST 6155b / MDVL 7155b / RLST 7770b, Jews in Muslim Lands from the Seventh through the Sixteenth Century Ivan Marcus
Introduction to Jewish culture and society in Muslim lands from the Prophet Muhammad to Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire.

JDST 2000a / ER&M 2519a / HIST 1219a / JDST 200 / MMES 1149a / RLST 1480a, Jews and the World: From the Bible through Early Modern Times Ivan Marcus
A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings.

Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP 0 Course cr

*** JDST 3060b / MMES 1157b / NELC 1570b / NELC 157b and NELC 1570b, Israeli Narratives** Shiri Goren

This course looks at contemporary representations of social, political, and domestic space in Israel through cultural production such as literature, visual work, and art. It focuses on close reading of major Israeli works in translation with attention to how their themes and forms relate to the Israeli condition. Reading and viewing include: Amos Oz's major novel A Tale of Love and Darkness, *Anne Frank: The Graphic Diary*, Maya Arad's novella "The Hebrew Teacher," TV show *Arab Labor* and writing by Yehudah Amichai, Etgar Keret, and Sayed Kashua, among others. We discuss topics and theories of personal and collective identity formation, war and peace, ethnicity and race, migration, nationalism, and gender. No knowledge of Hebrew required. WR, HU

*** JDST 3270a / HIST 3232a / HUMS 4430a / MMES 3342a / RLST 2010a, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

JDST 3446a / HIST 2249a, Making European Culture Jewish: Five Media, 1780–1930 Staff

This course studies the ways in which Jewish writers and artists turned European culture into Jewish culture, that is, how a minority group fashioned its own version of the majority culture. As European Jews encountered European culture and society, they had to grapple with a host of fundamental questions. What was Judaism and who were the Jews: a religion, a history, a culture, a nation? We examine the way in which writers and artists struggled with these issues in five media: memoir, theology, history, fiction, and painting, thereby creating Jewish versions first of Enlightenment, Romanticism, and realism (1780–1870) and then of nationalism, positivism, and modernism (1870–1930). WR, HU 0 Course cr

*** JDST 3451a / HIST 3768a / PLSC 3464a / RLST 3240a, The Global Right: From the French Revolution to the American Insurrection** Elli Stern

This seminar explores the history of right-wing political thought from the late eighteenth century to the present, with an emphasis on the role played by religious and pagan traditions. This course seeks to answer the question, what constitutes the right? What are the central philosophical, religious, and pagan, principles of those groups associated with this designation? How have the core ideas of the right changed over time? We do this by examining primary tracts written by theologians, political philosophers, and social theorists as well as secondary literature written by scholars interrogating movements associated with the right in America, Europe, Middle East and Asia. Though touching on specific national political parties, institutions, and think tanks, its focus is on mapping the intellectual overlap and differences between various

right-wing ideologies. While the course is limited to the modern period, it adopts a global perspective to better understand the full scope of right-wing politics. HU, SO

* **JDST 3812b / CPLT 1960b / MMES 3312b / NELC 3230b / NELC 323b and NELC 3230b, Hebrew Poetry in Muslim Spain** Peter Cole
Introduction to the Golden Age of Hebrew poetry in Muslim Andalusia from the tenth century through the twelfth. Major figures of the period and the cultural and philosophical questions they confronted. The Judeo-Arabic social context in which the poetry emerged; critical issues pertaining to the study and transmission of this literature. Readings from the works of several poets. Readings in translation. Additional readings in Hebrew available. HU

* **JDST 3843b / CPLT 3005b / ENGL 3415b / HUMS 1997b, Advanced Literary Translation** Peter Cole
A sequel to LITR 348 or its equivalent, this course brings together advanced and seriously committed students of literary translation, especially (but not only) those who are doing translation-related senior theses. Students must apply to the class with a specific project in mind, that they have been developing or considering, and that they will present on a regular basis throughout the semester. Discussion of translations-in-progress are supplemented by short readings that include model works from the world of literary translation, among them introductions and pieces of criticism, as well as reflections by practitioners treating all phases of their art. The class is open to undergraduates and graduate students who have taken at least one translation workshop. By permission of the instructor. Formerly ENGL 483. Prerequisite: LITR 348.

* **JDST 4205a / HEBR 1570a, Reading Between the Panels: Visual Narratives and the Culture of Hebrew Graphic Novels** Shiri Goren
Focusing on Hebrew graphic novels, an emerging genre in contemporary Israeli literature this course provides an opportunity for advanced Modern Hebrew students to engage with complex and creative narratives representing diverse aspects of Israeli society. The class focuses on developing, enhancing, and strengthening students' linguistic performances across the four language domains. Simultaneously, students engage in a high-level theoretical and textual analysis of the works in question. Most of the works studied have not been translated into English or other languages. Therefore, the only way for students to access the majority of these compelling texts is by reading them in the target language. Prerequisite: Placement exam or permission of instructor. L5, HU RP

Khmer (KHMR)

* **KHMR 1100a, Elementary Khmer I** Staff
Basic structures of modern standard Cambodian introduced through the integration of communicative practice, reading, writing, and listening comprehension. Introduction to Khmer society and culture. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L1 1½ Course cr

* **KHMR 1200b, Elementary Khmer II** Staff
Basic structures of modern standard Cambodian introduced through the integration of communicative practice, reading, writing, and listening comprehension. Introduction to

Khmer society and culture. Prerequisite: KHMR 110. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L2 1½ Course cr

KHMR 1300a, Intermediate Khmer I Staff
This course focuses on learning Khmer (the national language of Cambodia). Students communicate in day-to-day conversation using complex questions and answers. The course focuses on reading, writing, speaking, and listening to Khmer words, long sentences, and texts. The course also emphasizes grammar, sentence structure and using words correctly. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. Prerequisite: KHMR 120 or equivalent. L3 RP 1½ Course cr

KHMR 1400b, Intermediate Khmer II Staff
This course focuses on learning Khmer (the national language of Cambodia). Students communicate in every day conversation using complex questions/answers. The course focuses on reading, writing, speaking, and listening to Khmer words, long sentences, and texts. The course also emphasizes grammar, sentence structure and using words correctly. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. Prerequisite: KHMR 1300or equivalent. L4 RP 1½ Course cr

Kiswahili (SWAH)

SWAH 1110a, Beginning Kiswahili I John Wa'Njogu
A beginning course with intensive training and practice in speaking, listening, reading, and writing. Initial emphasis is on the spoken language and conversation. L1 1½ Course cr

SWAH 1130a, Intermediate Kiswahili I Veronica Waweru
Further development of students' speaking, listening, reading, and writing skills. Prepares students for further work in literary, language, and cultural studies as well as for a functional use of Kiswahili. Study of structure and vocabulary is based on a variety of texts from traditional and popular culture. Emphasis on command of idiomatic usage and stylistic nuance. After SWAH 120. L3 1½ Course cr

SWAH 1150a, Advanced Kiswahili I John Wa'Njogu
Development of fluency through readings and discussions on contemporary issues in Kiswahili. Introduction to literary criticism in Kiswahili. Materials include Kiswahili oral literature, prose, poetry, and plays, as well as texts drawn from popular and political culture. After SWAH 140. L5

SWAH 1170a, Topics in Kiswahili Literature John Wa'Njogu
Advanced readings and discussion with emphasis on literary and historical texts. Reading assignments include materials on Kiswahili poetry, Kiswahili dialects, and the history of the language. After SWAH 160. L5, HU

Korean (KREN)

* **KREN 1100a, Elementary Korean I** Staff
A beginning course in modern Korean. Pronunciation, lectures on grammar, conversation practice, and introduction to the writing system (*Hankul*). L1
1½ Course cr

* **KREN 1300a, Intermediate Korean I** Staff
Continued development of skills in modern Korean, spoken and written, leading to intermediate-level proficiency. After KREN 120 or equivalent. L3 1½ Course cr

* **KREN 1320a, Intermediate Korean for Advanced Learners I** Staff
Intended for students with some oral proficiency but little or no training in *Hankul*. Focus on grammatical analysis, the standard spoken language, and intensive training in reading and writing. L3 1½ Course cr

KREN 1500a, Advanced Korean I: Korean Language and Culture through K-Pop Music Angela Lee-Smith
An advanced language course with emphasis on developing vocabulary and grammar, practice reading comprehension, speaking on a variety of topics, and writing in both formal and informal styles. Use storytelling, discussion, peer group activities, audio and written journals, oral presentations, and supplemental audiovisual materials and texts in class. After KREN 140 or equivalent. L5

KREN 1520a, Advanced Korean III: Contemporary Life in Korea Hyunsung Lim
This course is an advanced language course designed to further develop language skills through topics related to contemporary Korea, including lifestyle, society, culture, and literature, supplemented with authentic media materials. This course aims to expand students' understanding of Korea while enhancing their multiliteracy. Intended for both non-heritage speakers and heritage speakers. Prerequisite: After KREN 142 or KREN 151, or equivalent. L5

* **KREN 1540a, Advanced Korean V: History and Society** Boo Kyung Jung
An advanced language course designed to develop reading and writing skills using Web-based texts in a variety of genres. Students read texts independently and complete comprehension and vocabulary exercises through the Web. Discussions, tests, and intensive writing training in class. After KREN 152 or equivalent. L5

Latin (LATN)

LATN 1001a, Beginning Latin: The Elements of Latin Grammar Staff
Introduction to Latin. Emphasis on morphology and syntax within a structured program of readings and exercises. Prepares for LATN 1002. No prior knowledge of Latin assumed. L1 1½ Course cr

LATN 1002b, Beginning Latin: Review of Grammar and Selected Readings Staff
Continuation of LATN 1001. Emphasis on consolidating grammar and on readings from Latin authors. The sequence LATN 1001 and 1002 prepares for 2003 or 2004. Prerequisite: LATN 1001 or equivalent. L2 1½ Course cr

* **LATN 1012a, Intensive Beginning Latin** Timothy Robinson
An accelerated course that covers in one term the material taught in LATN 110 and 120. Readings from Latin authors supplement intensive instruction in grammar and

vocabulary. Admits to LATN 131 or 141. Not open to students who have completed LATN 110 or 120. L1, L2 RP 2 Course cr

LATN 2003a, Latin Prose: An Introduction Staff
Close reading of a major work of classical prose; review of grammar as needed. Counts as L4 if taken after LATN 2004 or equivalent, or if placed into L4. L3

LATN 2004b, Latin Poetry: An Introduction Staff
An introduction to reading hexameter (epic) poetry in Latin. Readings come primarily from Vergil's Aeneid. Attention is paid both to grammar/syntax and to interpretation of poetic style and content. Counts as L4 if taken after LATN 2003 or equivalent, or if placed into L4. L3

LATN 3305a, Early Rome from Aeneas to Romulus John Dillon
Investigation of how the Romans imagined the founding of their nation and their city, events to which they attached the highest importance yet about which they had little information. Careful reading of both prose and verse by Vergil, Livy, Ovid, and others. A bridge course between L4 and other L5 courses. L5, HU

* **LATN 3315a, Ovid's Poetic Career** Kirk Freudenburg
A bridge course designed to transition students from L4 to L5 Latin, focused on the poetic career of the Roman poet Ovid. Readings are drawn from all the major works of Ovid, following their publication over the course of his long career. The course is designed to take students beyond matters of grammar, vocabulary, and syntax (though these are stressed) into the complex workings of Latin poetry (including metrics, stylistics, and advanced Latin syntax) and the larger political and social contexts of one of antiquity's greatest literary careers. Class sessions are devoted to close reading of Ovid's Latin, with strong emphasis on grammar and syntax; analysis of Ovid's art; discussion of cultural context; discussion of Ovid in reception and in modern scholarship. This course is designed for students who are proficient in Latin, having had at least 3–4 years of high school Latin, or a minimum of two full years of Latin at the college level. L5, HU

* **LATN 4465a, Martial** James Uden
Martial is a major author in a miniature mode. Over 1500 of Martial's Latin epigrams survive across fifteen books of poetry, and they offer concise, witty summations of every conceivable aspect of Roman life in the late first century CE. His corpus includes gift-tags, commemorations of public monuments, odes to patrons, and praise and blame of a shifting set of emperors. For some institutions—such as the Roman baths—Martial is our *only* substantial source of evidence in Latin literature. In reading his short poems, we can build a detailed picture of everyday Roman life, one poem at a time. From an aesthetic perspective, though, Martial presents a challenge. How do we read the work *en masse* of an author devoted to the fleeting, ephemeral, and small? Ability to read Latin at the L5 level, typically demonstrated by completion of an L4 course (whose course number ends with 4), by completion of an L5 "bridge" course (numbered at the 3000 level), or via placement score. L5, HU

* **LATN 4525a, Readings in Roman Environmental Thought** Kirk Freudenburg
An advanced Latin course (with L5 credit) focusing on ancient literary depictions of Roman encounters with the natural world. Through close readings of Latin texts, the class will examine how the Romans exploited their natural surroundings not only as physical resources, but as resources for human thought. The focus will be on how

ancient thinkers, living lives that were largely city-bound and detached from nature, structured their thoughts about the lives they lived (and about human existence more generally) by reference to their nonhuman surroundings: creatures, plants and places, some of which existed in the real world (in places far off, largely unknown and elsewhere; in places penetrated, explored, and/or told of), others of which existed entirely in the imagination, whether as inherited lore, or as places and creatures invented *ad hoc* by individuals and groups to get certain kinds of cultural work done. We will look not only at the how and what, but at the why of nature's encoding via culture, and vice versa (their symbiosis), paying special attention to conceptions of man and nature, natural history, agriculture, diet, human work (in the fields of war and on farms), waters, forests, bees and flowers. Prerequisites: The completion of two full years of Latin at the beginning and intermediate levels, as well as one 'bridge' course at the L5 level. L5, HU

Latin American Studies (LAST)

LAST 1100a / HIST 305a, Introduction to Latin American Studies: History, Culture and Society Lorena Ojeda-Davila

This course provides a political and social introduction to Latin America and the Caribbean, an extraordinarily diverse group of countries in the Western Hemisphere. Latin America is often presented as a region characterized by poverty, inequality, crime, drugs, political instability, and armed conflict. However, this stereotype does not reflect the remarkable economic and political development over the last few decades. While social, legal, political, and economic factors vary within and between the countries of the region, since the 1980s, many countries that faced authoritarian regimes transitioned to democracy; Most children in the region now have access to healthcare and attend school; The subcontinent is at the center of the climate justice agenda while dealing with new forms of colonialism from the "Global North"; Latin America is pioneering women's inclusion in politics, parity policies, and legal landmarks to combat gender-based political violence; Latin American feminism, queer activism, and movements advocating for the rights of black people, indigenous communities, and environmental protection are vibrant and have achieved pivotal accomplishments. Still, some governance challenges persist, and new ones have emerged. HU

LAST 1170a / AFST 2170a / ER&M 2568a / PORT 2170a, A Luta Continua: African, Asian, and Indigenous Responses to Coloniality in the Lusophone World Kevin Ennis

What did it mean to be anticolonial in the era of revolution against the Portuguese Empire, and what does it mean today in the twenty-first century across the Portuguese-speaking world? In this course we examine the reverberations of anticolonial movements in Portuguese-speaking African and Asian territories, as well as in Indigenous movements in Brazil. Focusing on political, social, and cultural dimensions of emancipation, we ask: How have African, Asian, and Indigenous writers and artists imagined emancipatory endeavors for their peoples, their countries, and their worlds? What is the role of cultural expression in world-sharing and world-building in response to centuries of colonialism and its legacies? This course also aims to further develop communicative proficiency in Portuguese and enhance knowledge of the diverse cultures of the Portuguese-speaking world. Prerequisite: PORT 140, or equivalent in placement. L5, HU

LAST 1200a / PLSC 2430a, Introduction to Latin American Politics Staff
Introduction to major theories of political and economic change in Latin America, and to the political and economic systems of particular countries. Questions include why the continent has been prone to unstable democratic rule, why countries in the region have adopted alternatively state-centered and market-centered economic models, and, with the most recent wave of democratization, what the remaining obstacles might be to attaining high-quality democracy. SO o Course cr

LAST 1214a / AFAM 1986a / PLSC 2417a / SOCY 1704a, Contesting Injustice Staff
Exploration of why, when, and how people organize collectively to challenge political, social, and economic injustice. Cross-national comparison of the extent, causes, and consequences of inequality. Analysis of mobilizations for social justice in both U.S. and international settings. Intended primarily for first years and sophomores. SO o Course cr

LAST 2165a / FILM 2167a / PORT 2165a / SPAN 2090a / WGSS 2165a, Through the Lens of Memory: Other Perspectives on Dictatorships in Latin America and Iberia Giseli Tordin
This course examines the cinematic portrayals of military dictatorships in Brazil, Argentina, Chile, Spain, and Portugal, exploring how film serves as both a historical document and a means to reinterpret and reconstruct the past. As a language course, it allows students to engage with multiple modes of meaning–linguistic, visual, auditory, tactile, gestural, and spatial–through which cinema conveys its narratives. Students analyze how films reconstruct memory, challenge hegemonic historiography, and reinscribe erased or silenced perspectives. The course reflects on the relevance of these works in contemporary struggles against violence and oppression, considering how they teach us to critically engage with power, resistance, and collective memory. It also focuses on women's cinematic productions and representations, examining how gender, race, and political resistance intersect in the visual representation of repression, violence, and memory. The course incorporates both Spanish and Portuguese, encouraging students to express their ideas and develop projects in either language. Languages: Portuguese and Spanish. Prerequisite: PORT 1400 (or equivalent) or SPAN 1400 (or equivalent). L5, HU

* **LAST 2222a / SPAN 2050a, Legal Spanish** Mercedes Carreras
An introduction to Spanish and Latin American legal culture with a focus on the specific traits of legal language and on the development of advanced language competence. Issues such as human rights, the death penalty, the jury, contracts, statutory instruments, and rulings by the constitutional courts are explored through law journal articles, newspapers, the media, and mock trials. Enrollment limited to 18. A maximum of one course in the 200-230 range may count as an elective toward the Spanish major. L5

* **LAST 2223a / SPAN 2020a, Spanish in Film: An Introduction to the New Latin American Cinema** Staff
Development of proficiency in Spanish through analysis of critically acclaimed Latin American films. Includes basic vocabulary of film criticism in Spanish as well as discussion and language exercises. Enrollment limited to 18. L5

*** LAST 2227a / SPAN 2100a, Creative Writing** Mayte López
An introduction to the writing of fiction, poetry, and creative nonfiction, with a focus on developing techniques and abilities that are essential for crafting imaginative texts and honing self-expression. Through in-class tasks, substantive discussions on composition and craft, and analyses of contemporary Latinx, Latin American, and Spanish works, students enhance their writing skills and nurture their unique voices as writers. This course takes on the format of a workshop, with students receiving constructive feedback from both the instructor and their fellow writers. Conducted in Spanish. Enrollment limited to 15. A maximum of one course in the 200–230 range may count as an elective toward the Spanish major. L5, HU

LAST 2228a / ER&M 1678a / SPAN 2145a, Borders & Globalization in Hispanophone Cultures Luna Najera
The borders that constitute the geographical divisions of the world are contingent, but they can have enormous ordering power in the lives of people and other beings. Human-made borders can both allow and disallow the flow of people and resources (including goods, knowledge, information, technologies, etc.). Like geographical borders, social borders such as race, caste, class, and gender can form and perpetuate privileged categories of humans that constrain the access of excluded persons to resources, education, security, and social mobility. Thus, bordering can differentially value human lives. Working with the premise that borders are sites of power, in this course we study bordering and debordering practices in the Hispanic cultures of Iberia, Latin America, and North America, from the 1490s to the present. Through analyses of a wide range of texts that may include treatises, maps, travel literature, visual culture, material culture (e.g., currency), law, music, and performance art, students investigate the multiple ways in which social, cultural, and spatial borders are initiated, expressed, materialized, and contested. More broadly, we explore, describe, and trace the entanglements of bordering, globalizations, and knowledge production in Hispanophone cultures. Some of the questions that will guide our conversations are: What are (social) borders and what are the processes through which they persist? How do the effects of practices that transcend borders (e.g., environmental pollution, deforestation) change our understanding of borders? What can we learn from indigenous peoples' responses to bordering process and globalization? Prerequisite: SPAN 140 or 145, or in accordance with placement results. The course is conducted entirely in Spanish. Readings are available electronically through Canvas and the University Library. To be conducted in Spanish. L5, HU

*** LAST 2261a / SPAN 2510a, Critical Contexts in Medieval and Early Modern Iberia** Jesus Velasco
This course offers a panoramic introduction to Iberian written cultures from the medieval to early modern period (ca. 800–1700). Organized chronologically and guided by the methodology of close reading, we will analyze a wide range of concepts and topics relevant for understanding the multilingual, multireligious contexts in which literary and non-literary works were produced, including knowledge and hospitality; borders and negotiation; authority and power; autobiography and eyewitness narrative accounts; courtly love and love sickness; makeup and cosmetic theory; prostitution and public health; gender dissidence and transgressive bodies; masculinities and misogyny; economic crisis and decline; black Africans and the African diaspora; the Inquisition and religious orthodoxy. Open to students who have placed into L5 courses or who

have successfully completed an L4 course in Spanish. Counts toward the major in Spanish. L5, HU

* **LAST 2266a / SPAN 2310a, Critical Contexts in Colonial Latin America** Lisa Voigt
This course offers a panoramic introduction to the written and visual cultural production of colonial Latin America (ca. 1492–1800). Organized chronologically and guided by the methodology of close reading, we analyze works of various genres and formats whose creators were of Indigenous, African, Spanish, and mestizo descent. We investigate how these texts reveal, critique, reimagine, or participate in the power relations of multiethnic societies founded on conquest, colonization, and slavery. Among our objectives is the development of the skills of critical analysis of texts written in Spanish, which we pursue through class discussion, oral presentations, and written and creative projects. L5, HU

* **LAST 2605a / SPAN 4605a, Pacific Bridges: Asian Diasporas Across Latin America** Inês Forjaz de Lacerda and Anibal González-Pérez
What do Borges and Bashō have in common? Why is K-Pop so popular in places like Chile and Brazil? And what can *Shōgun* teach us about the world? In this course, we dive into the unexpected connections between Asia and Latin America, tracing stories of migration, cultural fusion, and artistic exchange from colonial encounters to today's global pop culture. Our travels take us from early modern Japan, India, and the Philippines to today's Cuba, Brazil, Peru, and Argentina, with several other stops along the way. Through literature, film, music, and anime, we explore how Asian diasporas shaped, and were shaped by, the Spanish- and Portuguese-speaking worlds. Readings include Jorge Luis Borges, Cristina García, Chen Li, Augusto Higa Oshiro, Octavio Paz, Adriana Lisboa, and José Watanabe, among others. All materials are in English, with optional readings in Spanish and Portuguese for those interested in the original texts. Taught in English.

* **LAST 2675a / AFAM 3675a / AMST 3355a / ER&M 3574a / FREN 3675a, Haiti Writes I** Marlene Daut and Kaiama Glover
From nineteenth-century antislavery pamphleteering to accounts of ecological catastrophe in 21st-century fiction, Haitian literature has resounded across the globe since the nation's revolutionaries declared independence in 1804. Starting with pre-revolutionary writing, including the emergence of Haitian Creole letters, moving through a long, largely francophone nineteenth century, to present-day Haitian writing in the English language, this two-semester exploration of Haitian literature presents the political, cultural, and historical frameworks necessary to comprehend Haiti's vast literary output. Whether writing in Haiti or its wide-ranging diasporas, Haitian authors have boldly contributed to pressing conversations in global letters while reflecting Haiti's unique cultural and historical experiences. Considering an expansive array of poets, playwrights, and novelists—such as Baron de Vastey, Juste Chanlatte, Demesvar Delorme, Edwidge Danticat, René Depestre, Kettly Mars, Dany Laferrière, and Évelyne Trouillot—this course engages students in a fresh examination of Haiti's richly polyglot and transnational literary tradition that spans more than two centuries.

* **LAST 3068a / ANTH 3968a, Science Stories: Communicating Discovery Across Cultures** Diego Golombek
How do scientists share their discoveries beyond the lab—and why does it matter? In an age of misinformation, climate crisis, and global health challenges, communicating science is no longer optional: it's a core scientific responsibility. This course invites

students from the natural and exact sciences—and anyone curious about the power of knowledge—to explore how to turn complex ideas into stories that inspire, inform, and empower diverse audiences. Blending theory and practice, we will experiment with different media platforms: from writing and museum exhibits to live performance and digital storytelling. Special attention will be given to cultural context: how does science communication change across borders, languages, and worldviews? For students affiliated with CLAIS, the course will also offer deeper engagement with Latin American approaches to science, narrative, and public dialogue. Students will leave the course with practical communication skills, a portfolio of creative work, and a critical understanding of how science lives in society—not just as facts and data, but as a shared human endeavor.

* **LAST 3230a / HSAR 3230a, Illustrating Andean History: The Work of Guaman Poma** Staff

One of the most famous manuscripts to survive from the Spanish colonial Americas is the 1615 El primer nueva corónica y buen gobierno (The First New Chronicle, and Good Government, often called *Nueva corónica or New Chronicle*). The author was Indigenous Andean Felipe Guaman Poma de Ayala (c. 1535–c. 1616). This work is one of the most important sources for understanding Inka culture and colonial rule from an Indigenous perspective. It consists of 1,189 pages with 398 full-page ink line drawings. Few illustrated manuscripts survive from this period, and Guaman Poma's has no rival. The *New Chronicle* was written in Peru in Spanish, Quechua, Aymara, and Latin. But one might even consider the many images a fifth, purely visual language that combined Andean and European representation systems. Its images have become the most common illustrations of Andean history. In this course, we delve into the work's history and many-layered subtleties of its images to understand its import and the legacy of this Indigenous author. o Course cr

* **LAST 4491a, The Senior Essay** Ana De La O

Preparation of a research paper about forty pages long under the direction of a faculty adviser, in either the fall or the spring term. Students write on subjects of their own choice. During the term before the essay is written, students plan the project in consultation with a qualified adviser or the director of undergraduate studies. The student must submit a suitable project outline and bibliography to the adviser and the director of undergraduate studies by the third week of the term. The outline should indicate the focus and scope of the essay topic, as well as the proposed research methodology. Permission may be given to write a two-term essay after consultation with an adviser and the director of undergraduate studies and after submission of a project statement. Only those who have begun to do advanced work in a given area are eligible. The requirements for the one-term senior essay apply to the two-term essay, except that the two-term essay should be substantially longer.

LAST 4492a, The Senior Project Ana De La O

A project of creative work formulated and executed by the student under the supervision of a faculty adviser in the fall or spring term. Students work on projects of their own choice. Proposals for senior projects are submitted to the adviser and the director of undergraduate studies by the end of the term preceding the last resident term. An interim project review takes place by the fifth week of the term the project is developed. Permission to complete the senior project can be withdrawn if satisfactory progress has not been made. An exhibition of selected work done in the project is

expected of each student. Approval by the DUS and advisor by the end of the term preceding the last resident term.

Linguistics (LING)

*** LING 0110b, From Evidence to Court to The Constitution: Language and the Law** Claire Bowern

Laws are made through language, interpreted through language, and made about language. This class is an overview of legal aspects of language, the use of linguistic arguments in court cases, as well as other areas where linguistics meets the law. Through the study of language structure (sounds, words, and meaning), students gain an appreciation of the role of language in the law and in society, social justice issues around language, linguistic discrimination in legal contexts, and current and historical legislative debates around language use. Enrollment limited to first-year students. HU, SO

*** LING 0330a / ENGL 0133a, Words, Words, Words: The Structure and History of English Words** Peter Grund

Meggings. Perpendicular. Up. Ain't. Eerily. Bae. The. These are all words in the English language, but, like all words, they have different meanings, functions, and social purposes; indeed, the meaning and function may be different for the same word depending on the context in which we use it (whether spoken or written). In this course, we explore the wonderful world of words. We look at how we create new words (and why), how we change the meaning of words, and how words have been lost (and revived) over time. As we do so, we look at debates over words and their meanings now (such as the feeling by some that *ain't* is not a word at all) and historically (such as the distaste for *subpeditals* for 'shoes' in the sixteenth century), and how words can be manipulated to insult, hurt, and discriminate against others. We look at a wide range of texts by well-known authors (such as Shakespeare) as well as anonymous online bloggers, and we make use of online tools like the Google Ngram viewer and the Corpus of Historical American English to see how words change over time. At the end of the course, I hope you see how we make sophisticated use of words and how studying them opens up new ways for you to understand why other people use words the way they do and how you can use words for various purposes in your own speech and writing. Enrollment limited to first-year students. HU

*** LING 1070a / ER&M 1670a, Language Endangerment and Revitalization** Edwin Ko

Introduction to language endangerment and language revitalization. This course explores a range of theories and practices that provide the basis by which linguists and language activists aim to revitalize endangered languages in communities around the world. Beginning with surveying the various ways in which the world's linguistic diversity and language ecologies can be assessed and discussing the serious threats to that diversity, why this might be a matter of concern, and the principle of linguistic human rights, the course will narrow toward individual student projects to investigate a minority language in some depth and report on its status with respect to the range of issues discussed in class. WR, SO

LING 1100a, Language: Introduction to Linguistics Claire Bowern
This is a course about language as a window into the human mind and language as glue in human society. Nature, nurture, or both? Linguistics is a science that addresses this puzzle for human language. Language is one of the most complex of human behaviors, but it comes to us without effort. Language is common to all societies and is typically acquired without explicit instruction. Human languages vary within highly specific parameters. The conventions of speech communities exhibit variation and change over time within the confines of universal grammar, part of our biological endowment. The properties of universal grammar are discovered through the careful study of the structures of individual languages and comparison across languages. This course introduces analytical methods that are used to understand this fundamental aspect of human knowledge. In this introductory course students learn about the principles that underly all human languages, and what makes language special. We study language sounds, how words are formed, how humans compute meaning, as well as language in society, language change, and linguistic diversity. SO o Course cr

* **LING 1150a / SKRT 1100a, Introductory Sanskrit I** Aleksandar Uskokov
An introduction to Sanskrit language and grammar. Focus on learning to read and translate basic Sanskrit sentences in Devanagari script. No prior background in Sanskrit assumed. L1 1½ Course cr

LING 1160b / CGSC 2160b / CGSC 216b and CGSC 2160b / PSYC 116b / PSYC 1316b, Cognitive Science of Language Athulya Aravind
The study of language from the perspective of cognitive science. Exploration of mental structures that underlie the human ability to learn and process language, drawing on studies of normal and atypical language development and processing, brain imaging, neuropsychology, and computational modeling. Innate linguistic structure vs. determination by experience and culture; the relation between linguistic and nonlinguistic cognition in the domains of decision making, social cognition, and musical cognition; the degree to which language shapes perceptions of color, number, space, and gender. SO

LING 1179a / EDST 1237a / PSYC 3317a, Language and Mind Maria Pinango
The structure of linguistic knowledge and how it is used during communication. The principles that guide the acquisition of this system by children learning their first language, by children learning language in unusual circumstances (heritage speakers, sign languages) and adults learning a second language, bilingual speakers. The processing of language in real-time. Psychological traits that impact language learning and language use. SO RP o Course cr

LING 1310b, Languages of Africa Staff
Introduction to the almost 2000 languages of the African continent; phonology (sound systems), grammar and syntax, lexicon (words and word structure), semantics (word meanings); linguistic diversity and culture; language endangerment and planning, writing systems, and resources in natural language processing SO

LING 1380a / SKRT 1300a, Intermediate Sanskrit I Aleksandar Uskokov
The first half of a two-term sequence aimed at helping students develop the skills necessary to read texts written in Sanskrit. Readings include selections from the *Hitopadesa, Kathasaritsagara, Mahabharata,* and *Bhagavadgita.* After SKRT 120 or equivalent. L3

LING 1460b / PSYC 3129b / WGSS 1145b, Language and Gender Natalie Weber
An introduction to linguistics through the lens of gender. Topics include: gender as constructed through language; language variation as conditioned by gender and sexuality within and between languages across the world; real and perceived differences between male and female speech; language and (non)binarity; gender and noun class systems in language; pronouns and identity; role of language in encoding, reflecting, or reinforcing social attitudes and behavior. This course was previously offered as PSCY 329. SO

* **LING 1500a / ENGL 3501a, Old English** Emily Thornbury
An introduction to the language, literature, and culture of earliest England. A selection of both major and less-studied works of prose and verse, including charms, saints' lives, meditations on loss, a dream vision, and heroic verse, which are read in the original Old English. No prior knowledge of Old English is expected. WR, HU

* **LING 1650b / HEBR 1690b / JDST 4203 / MMES 1162b, Languages in Dialogue: Hebrew and Arabic** Dina Roginsky
Hebrew and Arabic are closely related as sister Semitic languages. They have a great degree of grammatical, morphological, and lexical similarity. Historically, Arabic and Hebrew have been in cultural contact in various places and in different aspects. This advanced Hebrew language class explores linguistic similarities between the two languages as well as cultural comparisons of the communities, built on mutual respect. Students benefit from a section in which they gain a basic exposure to Arabic, based on its linguistic similarity to Hebrew. Conducted in Hebrew. Prerequisite: HEBR 1400, or placement test, or permission of the instructor. L5, HU RP

* **LING 1910a / GMAN 3100a, "Sprachkrise" – Philosophies & Language Crises** Sophie Schweiger
The crisis of language predates the invention of ChatGPT (who may or may not have helped write this syllabus). This course delves into the concept of language crises and its long history from a philosophical and literary perspective, examining how crises of language are represented in literature and how they reflect broader philosophical questions about language, identity, and power. We explore different philosophical approaches to language, such as the history of language and philology (Herder, Humboldt, Nietzsche), structuralism and post-structuralism (Saussure), analytical and pragmatic philosophies (Wittgenstein), phenomenology and deconstruction (Heidegger), and analyze how these theories shape our understanding of language while simultaneously evoking its crisis. The course also examines how such language crises are represented and produced in literature and the arts; how authors and artists approach the complexities of language loss, and how crises help birth alternative systems of signification. Through close readings of literary texts by Hofmannsthal, Musil, Bachmann, et. al., we analyze the symbolic and metaphorical significance of language crises, as well as the ethical and political implications of language loss for (cultural) identity. Experimental use of language such as DaDa artwork, performance cultures, and "Sprachspiel" poetry by the "Wiener Gruppe," as well as contemporary KI/AI literature, further complement the theoretical readings. By exploring language crises through the lens of philosophy and literature, we gain a deeper understanding of the role of language – and its many crises – in shaping our understanding of ourselves and our communities. HU

LING 2030b / AFST 203b / ENGL 2003b, English in Post-Colonial Africa and the African Diaspora Staff
This course explores the importance of the English language in Post-colonial Africa. By examining the historical, socio-political, and cultural contexts that have influenced the evolution and adaptation of the English language, students will acquire insights into the linguistic diversity found in post-colonial Africa and its practical implications. The course explores the relationship between English and indigenous languages, focusing on their continuing influence in education, governance, literature, and identity formation. We also look at the linguistic structure of African American Vernacular English and explore possible connections to the languages of Africa and English-based creoles such as Gullah, spoken in the Caribbean and off the South Carolina coast. HU, SO

*** LING 2120b, Historical Linguistics I** Claire Bowern
How languages change, how we study change, and how language relates to other areas of society. This seminar is taught through readings chosen by instructor and students, on topics of interest. Prerequisite: LING 112 or equivalent. WR, SO

LING 2190b / ANTH 3880b, Introduction to Linguistic Phylogenetics Edwin Ko
The goal of linguistic phylogenetics is to establish the relationships among the world's languages. This course surveys the history of linguistic phylogenetics that has employed quantitative and computational methods in the past century. Another goal of the course is to provide students with an overview of more recent computational methods originally developed for studying evolutionary biology but extended and adapted for use in studying linguistic change. WR, SO o Course cr

LING 2200a / PSYC 3318a, Phonetics I Jason Shaw
Each spoken language composes words using a relatively small number of speech sounds, a subset of the much larger set of possible human speech sounds. This course introduces tools to describe the complete set of speech sounds found in the world's spoken languages. It covers the articulatory organs involved in speech production and the acoustic structure of the resulting sounds. Students learn how to transcribe sounds using the International Phonetic Alphabet, including different varieties of English and languages around the world. The course also introduces sociophonetics, how variation in sound patterns can convey social meaning within a community, speech perception, and sound change. SO o Course cr

LING 2249b, Mathematics of Language Robert Frank
Study of formal systems that play an important role in the scientific study of language. Exploration of a range of mathematical structures and techniques; demonstrations of their application in theories of grammatical competence and performance including set theory, graphs and discrete structures, algebras, formal language, and automata theory. Evaluation of strengths and weaknesses of existing formal theories of linguistic knowledge. QR, SO o Course cr

LING 2270a / PSYC 3327a, Language and Computation I Staff
This course introduces the design and analysis of computational models of language. There are many properties of language that make it challenging to handle computationally: First, language is ambiguous—a given word or sentence can have many possible meanings. Second, our linguistic experience is sparse—many aspects of language (e.g., certain sentence structures) occur very rarely, posing a challenge for

computational systems that learn from data. Third, language has an enormous amount of hidden structure—words and other linguistic units can have complex relationships with each other that are not apparent on the surface. In this course, we explore the computational approaches that can overcome these challenges. Topics include finite state tools, neural networks, Bayesian approaches, computational morphology and phonology, grammar and parsing, lexical semantics, and the use of linguistic models in applied problems. Prerequisite: prior programming experience or permission of instructor. QR, SO

* **LING 2320b, Phonology I** Natalie Weber
Why do languages sound distinct from one another? Partly it is because different languages use different sets of sounds (in spoken languages) or signs (in signed languages) from one another. But it is also because those sounds and signs have different distributional patterns in each language. Phonology is the study of the systematic organization and patterning of sounds and signs. Students learn to describe the production of sounds and signs (articulatory phonetics), discuss restrictions on sound and sign distribution (morphemic alternation, phonotactics), and develop a model of the phonological grammar in terms of rules and representations. Throughout the course, we utilize datasets taken from a variety of the world's languages. General Phonetics (Ling 220) or a B or higher in Introduction to Linguistics (Ling 110). SO

* **LING 2340a, Quantitative Linguistics** Edwin Ko
This course introduces statistical methods in linguistics, which are an increasingly integral part of linguistic research. The course provides students with the skills necessary to organize, analyze, and visualize linguistic data using R, and explains the concepts underlying these methods, which set a foundation that positions students to also identify and apply new quantitative methods, beyond the ones covered in this course, in their future projects. Course concepts are framed around existing linguistic research, to help students design future research projects and critically evaluate academic literature. Assignments and in-class activities involve a combination of hands-on practice with quantitative tools and discussion of analyses used in published academic work. The course also include brief overviews of linguistic topics as a foundation for discussing the statistical methods used to investigate them. QR, SO

* **LING 2349b, Experimental Semantics** Maria Pinango
The structure of meaning as part of the human cognitive system. How language use, which is serial and local in nature, is able to package meaning, which is multidimensional and atemporal. Psycholinguistic and cognitive modeling of core phenomena in lexical and compositional semantics. Readings from the fields of neurocognition and cognitive psychology, model-theoretic and lexico-conceptual semantics, and pragmatics. Prerequisite: LING 005, 110, 117, 260, 263, or CGSC 110, or with permission of instructor. SO

LING 2530a, Syntax I Staff
If you knew all the words of a language, would you be able to speak that language? No, because you'd still need to know how to put the words together to form all and only the grammatical sentences of that language. This course focuses on the principles of our mental grammar that determine how words are put together to form sentences. Some of these principles are shared by all languages, some differ from language to language. The interplay of the principles that are shared and those that are distinct allows us to understand how languages can be very similar and yet also very different at

the same time. This course is mainly an introduction to syntactic theory: it introduces the questions that the field asks, the methodology it employs, some of the main generalizations that have been drawn and results that have been achieved. Secondarily, this course is also an introduction to scientific theorizing: what it means to construct a scientific theory, how to test it, and how to choose among competing theories. SO
o Course cr

LING 2630a, Semantics I Simon Charlow
Introduction to truth-conditional compositional semantics. Set theory, first- and higher-order logic, and the lambda calculus as they relate to the study of natural language meaning. Some attention to analyzing the meanings of tense/aspect markers, adverbs, and modals. Prerequisites: One course in linguistics, philosophy of language, logic, computer science or permission of instructor. QR, SO o Course cr

LING 2710a / PHIL 2271a, Philosophy of Language Zoltan Szabo
An introduction to contemporary philosophy of language, organized around four broad topics: meaning, reference, context, and communication. Introduction to the use of logical notation. HU o Course cr

LING 2750b / CGSC 2750b / PHIL 2280b, Pragmatics Simon Charlow
Speakers often mean things they don't say, but how does a hearer figure out what the speaker meant? Which sentences are designed to change the world rather than just to represent it? How are sentences used to mean different things in different contexts? Pragmatics explores the relations between what is said and what is meant, focusing on how speech acts and the principles of "street logic"—presuppositions and implicatures—help speakers and hearers shape the landscape of a conversation. No formal prerequisites, but some familiarity with linguistics or philosophy of language will help on some of the readings. SO RP

LING 2790a, Morphology I Jim Wood
In this course, we dive into the fascinating world of morphology, where we uncover the inner workings of words and explore how they're constructed from smaller building blocks. As theoretical linguists—and morphologists—our objective is to understand what shapes language at the morphological level. This semester, we tackle a wide array of topics, from methods of morphological analysis to the mechanisms that seem to give language its flexibility, including affixation, reduplication, compounding, and cliticization. We also examine how morphology interacts with other areas of grammar, such as phonology and syntax. SO

* **LING 3120a, Historical Linguistics II** Claire Bowern
How languages change, how we study change, and how language relates to other areas of society. Applications of historical linguistics to the study of the past (e.g. in linguistic paleontology); quantitative approaches to language change, signed language linguistic change. This class builds on material introduced in Historical Linguistics I. Prerequisite: LING 2120 Historical Linguistics I or permission of instructor. WR, HU, SO

* **LING 3270b / ARBC 4500b / NELC 4530b, History of the Arabic Language** Kevin van Bladel
This course covers the development of the Arabic language from the earliest epigraphic evidence through the formation of the Classical 'Arabiyya and further, to Middle Arabic

and Neo-Arabic. Readings of textual specimens and survey of secondary literature. Prerequisite: ARBC 1400 and permission of instructor.

*** LING 3289a, Laboratory Phonology** Jason Shaw
Experimentation has emerged as an important methodology for studying phonological knowledge, the mental representation of sound patterns in language. This seminar style course discusses current approaches to analyzing sound patterns of diverse languages using experimental data. We read seminal and recent papers developing methods for relating phonological form, including syllable structure, phonotactics, alternations, stress, and intonation, to its expression in articulatory and acoustic phonetics. Prerequisite: LING 235 or LING 220, or LING 238. SO

LING 3310b / PSYC 3531b, Neurolinguistics Maria Pinango
The study of language as a cognitive neuroscience. The interaction between linguistic theory and neurological evidence from brain damage, degenerative diseases (e.g., Alzheimer's disease), mental illness (e.g., schizophrenia), neuroimaging, and neurophysiology. The connection of language as a neurocognitive system to other systems such as memory and music. At least one class that introduces students to linguistic theory and linguistic argumentation from at least one perspective, including any of the following: (1) LING 217 Language and Mind, (2) LING 110 Intro to linguistics, (3) LING 253 Syntax 1, (4) LING 112 Historical Linguistics, (5) LING 232 Phonology 1, (6) LING 220 General Phonetics, or (7) Instructor permission. SC, SO
0 Course cr

*** LING 3360b, Articulatory Phonology** Jason Shaw
Study of experimental methods to record articulatory movements using electromagnetic articulography and/or ultrasound technologies and analytical approaches for relating articulatory movements to phonological structure. Hands-on training in laboratory techniques are paired with discussion of related experimental and theoretical research. Prerequisites: LING 220 and LING 232 or permission of instructor. SO

*** LING 3410b, Field Methods** Edwin Ko
Principles of phonetics, phonology, morphology, syntax, and semantics applied to the collection and interpretation of novel linguistic data. Data are collected and analyzed by the class as a group, working directly with a speaker of a relatively undocumented language. Discussion of ethics, linguistic diversity, and endangerment, Open to majors and graduate students in Linguistics, and to others with permission of instructor. Students should have taken LING 232 or LING 220 and one other linguistics class. SO

LING 3540b, Syntax II Jim Wood
This course continues the development of the "principles and parameters" approach to grammatical theory in Government-Binding theory and the Minimalist Program. We begin with a brief review of the architecture of syntactic theory, move on to an extended exploration of the mechanisms of dependency formation in syntax (including displacement, agreement, control, scope and anaphora), and conclude with a discussion of the nature of syntactic representation (constituency in double object constructions, the mapping between structure and thematic relations, the role of functional categories). Throughout, a major goal of the course is to engage in foundational issues by reading primary literature in syntax and applying theoretical concepts to novel data. Prerequisite: LING 253. WR, SO

LING 3610a / PSYC 163, Language Acquisition Athulya Aravind
The development of communication and language in children from birth to adolescence. Preverbal communication, lexical learning, morphological and syntactic development, phonological perception and production, the acquisition of pragmatic and communicative competence, and the relation of these skills to literacy. SO

* **LING 3640b, Semantics II** Staff
The model-theoretic approach to semantics and its treatment of core linguistic phenomena. Topics include quantification; tense, aspect, and modality; context and interpretation; and the semantics-pragmatics interface. Prerequisite: LING 263 or permission of instructor. QR, SO

* **LING 3770a, Topics in Syntax: Special Topics** Staff
In this course, we take a detailed look at our current understanding of an area of natural language syntax and open questions in that area. LING 253 Syntax I, or equivalent experience SO

LING 3780a, Lexical Semantics Maria Pinango
This course explores the fundamental issues and concepts in the linguistic study of word meaning, as well as the relation between the semantics of words and other aspects of meaning, such as context-dependent (pragmatic) meaning. The course is organized as an overview of the core semantic properties of three syntactic categories in natural languages: verbs, adjectives, and nouns. Topics to be covered include verb classes, aspect, semantic roles, vagueness, gradability, antonymy, sense and reference, and categorization. Primary emphasis is placed on elucidating the fundamental empirical issues that must be accounted for, but we also explore different theoretical approaches to these issues, with an eye towards identifying the role of lexical item meaning in the overall system of meaning in natural language and in the architecture of the language system. Prerequisites: At least one of the following: LING 110, LING 117/PSYCH 137, LING 120/PSYC 318, CGSC 110/PSYC 130, PSYC 110, LING 375 or consent of instructor. SO 0 Course cr

* **LING 3790b, The Syntax-Morphology Interface** Jim Wood
Syntax and morphology are intertwined in many fascinating ways, and in fact, many current theories take the building of words, phrases, and sentences to involve the same mechanisms in the same modules of grammar. Whether this view is correct or not, there are many phenomena where the form of a word and the structure of a phrase or sentence interact in a way that deserves special attention. This seminar focuses on such phenomena. While there are many things that fall under the umbrella of this course (see possible term paper topics in syllabus), much of the class is devoted to cases where morphological syncretism makes a syntactic structure possible that otherwise would not be. Prerequisite: LING 253. Either LING 280 or LING 254 would be a huge plus as well, but are not strictly necessary. Please contact the instructor if you have questions. SO

* **LING 3800a or b, Topics in Computational Linguistics: Neural Network Models of Linguistic Structure** Staff
An introduction to the computational methods associated with "deep learning" (neural network architectures, learning algorithms, network analysis). The application of such methods to the learning of linguistic patterns in the domains of syntax, phonology, and semantics. Exploration of hybrid architectures that incorporate linguistic representation into neural network learning. Prerequisites: Python programming, basic calculus and

linear algebra, introduction to linguistic theory (LING 106, 110, 116, 217 or equivalent). QR, SO

LING 3840b, Computational Psycholinguistics Staff
When processing language, the human mind can perform remarkable feats. For instance, we can acquire a language from a small amount of data—thousands of times less data than current systems in artificial intelligence—and we can infer what another person means even when that person's intended message goes beyond the literal meaning of their words. This course explores how computational modeling can help us characterize our incredible capacity for language learning and processing. We focus on three modeling traditions—symbolic algorithms, Bayesian models, and neural networks—and their application to a range of psycholinguistic phenomena, including parsing, pragmatics, speech perception, word learning, and language acquisition. We also discuss how artificial intelligence can inform theories of human language processing and vice versa. Prerequisites: One prior course in Linguistics, or permission of the instructor and Familiarity with Python programming, or permission of the instructor QR, SO

* **LING 3910a or b, Topics in Semantics: Current Issues** Staff
This course bridges introductory courses (LING 2630, LING 2640) and advanced seminars in semantics. It explores selected topics in some detail, allowing students to appreciate the nuances of semantic argumentation while at the same time emphasizing the foundational issues involved. The goal of this course is to allow students, within a structured format, to become comfortable engaging with open-ended problems and to gain confidence in proposing original solutions to such problems. Topics vary across semesters. Prerequisite: LING 2630 / LING 6630 or permission of Instructor SO

* **LING 4710b, Special Projects** Jason Shaw
Special projects set up by students with the help of a faculty adviser and the director of undergraduate studies to cover material not otherwise offered by the department. The project must terminate with at least a term paper or its equivalent and must have the approval of the director of undergraduate studies. Only one term may be offered toward the major; two terms may be offered toward the bachelor's degree.

* **LING 4900a / PSYC 3372a, Research Methods in Linguistics** Simon Charlow
Development of skills in linguistics research, writing, and presentation. Choosing a research area, identifying good research questions, developing hypotheses, and presenting ideas clearly and effectively, both orally and in writing; methodological issues; the balance between building on existing literature and making a novel contribution. Prepares for the writing of the senior essay.

* **LING 4910b, The Senior Essay** Jason Shaw
Research and writing of the senior essay under the guidance of a faculty adviser. Students present research related to their essays in a weekly colloquium. Prerequisite: LING 490.

Mathematics (MATH)

* **MATH 1030b, Mathematics of Voting** Meghan Anderson
This course explores applications of mathematics to politics. Students consider historical and contemporary questions about voting methods and districting through a mathematical lens, at an accessible level. These explorations engage with ideas of proof

and cultivate relevant quantitative reasoning skills. Topics include ranked choice voting methods and gerrymandering. Permission of instructor required. Enrollment limited to 25 students who have not previously taken a high school or college calculus course. Assumes fluency in high school algebra. QR

* **MATH 1070a, Mathematics in the Real World** Miki Havlickova
The use of mathematics to address real-world problems. Applications of exponential functions to compound interest and population growth; geometric series in mortgage payments, amortization of loans, present value of money, and drug doses and blood levels; basic probability, Bayes's rule, and false positives in drug testing; elements of logic. Permission of instructor required. Enrollment limited to 25 students who have not previously taken a high school or college calculus course. QR

* **MATH 1100a, Introduction to Functions and Calculus I** Sarah Days-Merrill
Comprehensive review of precalculus, limits, differentiation and the evaluation of definite integrals, with applications. Precalculus and calculus topics are integrated. Emphasis on conceptual understanding and problem solving. Successful completion of MATH 110 and 111 is equivalent to MATH 112. No prior acquaintance with calculus is assumed; some knowledge of algebra and precalculus mathematics is helpful. The course includes mandatory weekly workshops, scheduled at the beginning of term. Placement into MATH 110 on the Mathematics placement exam is required. Enrollment in MATH 110 is through preference selection, except during April registration (where sections are open to everyone who has placement in the course). QR

* **MATH 1110b, Introduction to Functions and Calculus II** Sarah Days-Merrill
Continuation of MATH 110. Comprehensive review of precalculus, limits, differentiation and evaluation of definite integrals, with applications. Precalculus and calculus topics are integrated. Emphasis on conceptual understanding and problem solving. Successful completion of both MATH 110 and 111 is equivalent to MATH 112. The course includes mandatory weekly workshops, scheduled at the beginning of term. Prerequisite: MATH 110. Enrollment in MATH 111 is through preference selection. QR

* **MATH 1120a or b, Calculus of Functions of One Variable I** Staff
This course introduces the notions of derivative and of definite integral for functions of one variable, with some of their physical and geometrical motivation and interpretations. Emphasis is placed on acquiring an understanding of the concepts that underlie the subject, and on the use of those concepts in problem solving. This course also focuses on strategies for problem solving, communication and logical reasoning. Placement into MATH 112 on the Mathematics placement exam is required. No prior acquaintance with calculus or computing assumed. May not be taken after MATH 111, MATH 115, MATH 116, MATH 120, or MATH 121. Enrollment in MATH 112 is through preference selection, except during April registration (where sections are open to everyone who has placement in the course). QR

* **MATH 1150a or b, Calculus of Functions of One Variable II** Staff
A continuation of MATH 112, this course develops concepts and skills at the foundation of the STEM disciplines. In particular, we introduce Riemann sums, integration strategies, series convergence, and Taylor polynomial approximation. We use these tools to measure lengths of parametric curves, areas of polar regions and volumes of solids of revolution, and we explore applications of calculus to other disciplines

including physics, economics, and statistics. MATH 115 also focuses on strategies for problem solving, communication, and logical reasoning. Prerequisite: MATH 111 or MATH 112, or placement into MATH 115 on the Mathematics placement exam. May not be taken after MATH 116, MATH 120, or MATH 121. Enrollment in MATH 115 is through preference selection, except during April registration (in this case sections are open to everyone who has placement in the course). QR

* **MATH 1160a, Mathematical Models in the Biosciences I: Calculus Techniques**
Staff
Techniques and applications of integration, approximation of functions by polynomials, modeling by differential equations. Introduction to topics in mathematical modeling that are applicable to biological systems. Discrete and continuous models of population, neural, and cardiac dynamics. Stability of fixed points and limit cycles of differential equations. Prerequisite: MATH 112, or placement into MATH 115/MATH 116 on the Mathematics placement exam. May not be taken after MATH 115, MATH 120, or MATH 121. QR

* **MATH 1180a or b, Introduction to Functions of Several Variables** Staff
A combination of linear algebra and differential calculus of several variables. Matrix representation of linear equations, Gauss elimination, vector spaces, independence, basis and dimension, projections, least squares approximation, and orthogonality. Three-dimensional geometry, functions of two and three variables, level curves and surfaces, partial derivatives, maxima and minima, and optimization. Intended for students in the social sciences, especially Economics. May not be taken after MATH 120, 222, 225, or 226. Prerequisite: MATH 112. QR

* **MATH 1200a or b, Calculus of Functions of Several Variables** John Hall
Analytic geometry in three dimensions, using vectors. Real-valued functions of two and three variables, partial derivatives, gradient and directional derivatives, level curves and surfaces, maxima and minima. Parametrized curves in space, motion in space, line integrals; applications. Multiple integrals, with applications. Divergence and curl. The theorems of Green, Stokes, and Gauss. Prerequisite: MATH 115 or 116, or placement into MATH 120 on the Mathematics placement exam. May not be taken after MATH 121 or after MATH 302. Enrollment in MATH 120 is through preference selection, except during April registration (where sections are open to everyone who has placement in the course). QR

* **MATH 1210b, Mathematical Models in the Biosciences II: Advanced Techniques**
Staff
Mathematical modeling for the biosciences, with a strong focus on multivariable calculus techniques. Applications may include epidemiological models, mathematical foundations of virus and antiviral dynamics, ion channel models and cardiac arrhythmias, and evolutionary models of disease. Prerequisite: MATH 115 or 116, or placement into MATH 120/121 on the Mathematics placement exam. May not be taken after MATH 120. QR

MATH 2220a or b / AMTH 2220a or b, Linear Algebra with Applications Staff
Matrix representation of linear equations. Gauss elimination. Vector spaces. Linear independence, basis, and dimension. Orthogonality, projection, least squares approximation; orthogonalization and orthogonal bases. Extension to function spaces. Determinants. Eigenvalues and eigenvectors. Diagonalization. Difference equations

and matrix differential equations. Symmetric and Hermitian matrices. Orthogonal and unitary transformations; similarity transformations. Students who plan to continue with upper level math courses should instead consider MATH 225 or 226. After MATH 115 or equivalent. May not be taken after MATH 225 or 226. QR

MATH 2250a or b, Linear Algebra Staff
An introduction to the theory of vector spaces, matrix theory and linear transformations, determinants, eigenvalues, inner product spaces, spectral theorem. The course focuses on conceptual understanding and serves as an introduction to writing mathematical proofs. For an approach focused on applications rather than proofs, consider MATH 222. Students with a strong mathematical background or interest are encouraged to consider MATH 226. Prerequisite: MATH 115 or equivalent. May not be taken after MATH 222, 226, or 231. QR

* **MATH 2260a, Linear Algebra (Intensive)** Tianqi Wang
A fast-paced introduction to the theory of vector spaces, matrix theory and linear transformations, determinants, eigenvalues, inner product spaces, spectral theorem. Topics are covered at a deeper level than in MATH 225, and additional topics may be covered, for example canonical forms or the classical groups. The course focuses on conceptual understanding. Familiarity with writing mathematical proofs is recommended. For a less intensive course, consider MATH 225. For an approach focused on applications, consider MATH 222. Prerequisite: MATH 115 or equivalent. May not be taken after MATH 222, 225, or 231. QR

MATH 2320b / AMTH 2320b, Advanced Linear Algebra with Applications Ian Adelstein
This course is a natural continuation of MATH 222. The core content includes eigenvectors and the Spectral Theorem for real symmetric matrices; singular value decomposition (SVD) and principle component analysis (PCA); quadratic forms, Rayleigh quotients and generalized eigenvalues. We also consider a number of applications: optimization and stochastic gradient descent (SGD); eigen-decomposition and dimensionality reduction; graph Laplacians and data diffusion; neural networks and machine learning. A main theme of the course is using linear algebra to learn from data. Students complete (computational) projects on topics of their choosing. Prerequisites: MATH 120 and MATH 222, 225, or 226. This is not a proof-based course. May not be taken after MATH 340 (previously MATH 240. QR

MATH 2410a / S&DS 2410a, Probability Theory Sinho Chewi
Introduction to probability theory. Topics include probability spaces, random variables, expectations and probabilities, conditional probability, independence, discrete and continuous distributions, central limit theorem, Markov chains, and probabilistic modeling. After or concurrently with MATH 120 or equivalent. QR

MATH 2420b / S&DS 2420b, Theory of Statistics Zhou Fan
Study of the principles of statistical analysis. Topics include maximum likelihood, sampling distributions, estimation, confidence intervals, tests of significance, regression, analysis of variance, and the method of least squares. Some statistical computing. After S&DS 241 and concurrently with or after MATH 222 or 225, or equivalents. QR

MATH 2440a or b / AMTH 2440a or b, Discrete Mathematics Staff
Basic concepts and results in discrete mathematics: graphs, trees, connectivity, Ramsey theorem, enumeration, binomial coefficients, Stirling numbers. Properties of finite set systems. Prerequisite: MATH 115 or equivalent. Some prior exposure to proofs is recommended (ex. MATH 225). QR

MATH 2460a or b, Ordinary Differential Equations Staff
First-order equations, second-order equations, linear systems with constant coefficients. Numerical solution methods. Geometric and algebraic properties of differential equations. After MATH 120 or equivalent; after or concurrently with MATH 222 or 225 or 226 or equivalent. QR

MATH 2470b / AMTH 2470b, Intro to Partial Differential Equations Ruoyu Wang
Introduction to partial differential equations, wave equation, Laplace's equation, heat equation, method of characteristics, calculus of variations, series and transform methods, and numerical methods. Prerequisites: MATH 222 or 225 or 226, MATH 246 or ENAS 194 or equivalents. QR

MATH 2510b / EENG 434 / S&DS 3510b, Stochastic Processes Ilias Zadik
Introduction to the study of random processes including linear prediction and Kalman filtering, Poison counting process and renewal processes, Markov chains, branching processes, birth-death processes, Markov random fields, martingales, and random walks. Applications chosen from communications, networking, image reconstruction, Bayesian statistics, finance, probabilistic analysis of algorithms, and genetics and evolution. Prerequisite: S&DS 241 or equivalent. QR

MATH 2550a or b, Analysis 1 Staff
Introduction to Analysis. Properties of real numbers, limits, convergence of sequences and series. Power series, Taylor series, and the classical functions. Differentiation and Integration. Metric spaces. The course focuses on conceptual understanding. Familiarity with writing mathematical proofs is assumed, and is further developed in the course. Prerequisite: MATH 115 or equivalent, and MATH 225 or 226. May not be taken after MATH 256, 300, or 301. QR

* **MATH 2560b, Analysis 1 (Intensive)** Staff
Fast-paced introduction to Analysis. Properties of real numbers, limits, convergence of sequences and series. Power series, Taylor series, and the classical functions. Differentiation and Integration. Metric spaces. The course focuses on conceptual understanding. Familiarity with writing mathematical proofs is assumed, and is further developed in the course. Prerequisite: MATH 115 or equivalent, and MATH 225 or 226. May not be taken after MATH 255, 300, or 301. QR

MATH 2700b, Set Theory Meghan Anderson
Algebra of sets; finite, countable, and uncountable sets. Cardinal numbers and cardinal arithmetic. Order types and ordinal numbers. The axiom of choice and the well-ordering theorem. After MATH 120 or equivalent. QR

MATH 3020a or b, Vector Analysis and Integration on Manifolds Staff
A rigorous treatment of the modern toolkit of multivariable calculus. Differentiation and integration in R^n. Inverse function theorem. Fubini's theorem. Multilinear algebra and differential forms. Manifolds in R^n. Generalized Stokes' Theorem. The course focuses on conceptual structure and proofs, and serves as a gateway to more

advanced courses which use the language of manifolds. Prerequisites: MATH 225 or 226, and MATH 255 or 256. QR

MATH 3050b, Analysis 2: Lebesgue Integration and Fourier Series Charles Smart
The Lebesgue integral, Fourier series, applications to differential equations. Prerequisites: MATH 225 or 226, and MATH 255 or 256 or 301. With permission of instructor, may be taken after MATH 225 or 226, and MATH 231 or 250. QR

MATH 3100a, Introduction to Complex Analysis Hee Oh
An introduction to the theory and applications of functions of a complex variable. Differentiability of complex functions. Complex integration and Cauchy's theorem. Series expansions. Calculus of residues. Conformal mapping. Prerequisites: MATH 225 or 226 or 231, and MATH 255 or 256 or 230 or 250, and MATH 302 or 120. QR

* **MATH 3150b, Intermediate Complex Analysis** Alexander Goncharov
Continuation of MATH 310. Topics may include argument principle, Rouché's theorem, Hurwitz theorem, Runge's theorem, analytic continuation, Schwarz reflection principle, Jensen's formula, infinite products, Weierstrass theorem. Functions of finite order, Hadamard's theorem, meromorphic functions. Mittag-Leffler's theorem, subharmonic functions. After MATH 310. QR

* **MATH 3200a, Measure Theory and Integration** Sebastian Hurtado-Salazar
Construction and limit theorems for measures and integrals on general spaces; product measures; Lp spaces; integral representation of linear functionals. After MATH 305 or equivalent. QR

MATH 3220a / AMTH 3220a, Geometric and Topological Methods in Machine Learning Smita Krishnaswamy
This course provides an introduction to geometric and topological methods in data science. Our starting point is the manifold hypothesis: that high dimensional data live on or near a much lower dimensional smooth manifold. We introduce tools to study the geometric and topological properties of this manifold in order to reveal relevant features and organization of the data. Topics include: metric space structures, curvature, geodesics, diffusion maps, eigenmaps, geometric model spaces, gradient descent, data embeddings and projections, and topological data analysis (TDA) in the form of persistence homology and their associated "barcodes." We see applications of these methods in a variety of data types. Prerequisites: MATH 225 or 226; MATH 255 or 256; MATH 302; and CPSC 112 or equivalent programming experience. Students who completed MATH 231 or 250 may substitute another analysis course level 300 or above in place of MATH 302. QR, SC

* **MATH 3250b, Introduction to Functional Analysis** Hanwen Zhang
Hilbert, normed, and Banach spaces; geometry of Hilbert space, Riesz-Fischer theorem; dual space; Hahn-Banach theorem; Riesz representation theorems; linear operators; Baire category theorem; uniform boundedness, open mapping, and closed graph theorems. After MATH 320, or after MATH 305 with permission of instructor. QR

MATH 3300a / S&DS 4000a, Advanced Probability Shuangping Li
Measure theoretic probability, conditioning, laws of large numbers, convergence in distribution, characteristic functions, central limit theorems, martingales. Some knowledge of real analysis assumed. QR

MATH 3400b, Advanced Linear Algebra Staff
The course continues the study of linear algebra from MATH 225 or MATH 230/231. It discusses several aspects of linear algebra that are of crucial importance for the subject and its applications to abstract algebra, geometry and number theory. Topics include generalized eigenspaces and Jordan normal form theorem, dual vector spaces, bilinear and hermitian forms, symmetric and hermitian operators, Hom spaces and tensor products. Previously MATH 240. After MATH 225 or 226 or 231. Two semesters of proof-based mathematics courses are recommended.

* **MATH 3450a, Modern Combinatorics** Van Vu
Recent developments and important questions in combinatorics. Relations to other areas of mathematics such as analysis, probability, and number theory. Topics include probabilistic method, random graphs, random matrices, pseudorandomness in graph theory and number theory, Szemeredi's theorem and lemma, and Green-Tao's theorem. Prerequisite: Either MATH 244, or another full-semester course in discrete math together with MATH 225. QR

MATH 3500a or b, Introduction to Abstract Algebra Staff
Group theory: isomorphism theorems, subgroups and quotient groups, group actions, Sylow theorems, direct and semidirect products. Ring theory: ideals and quotient rings, Euclidean domains, principal ideal domains, unique factorization domains. Prerequisites: one term of linear algebra and two terms of proof-based mathematics courses. (For example, MATH 225 and 255, or MATH 225 and 244.) QR

MATH 3700b, Fields and Galois Theory Miki Havlickova
Galois theory studies the correspondence between group theory and the theory of fields. The topics will include finite and infinite fields, their extensions and automorphisms, as well as applications such as solvability of equations by radicals or constructions with ruler and compass. The course is a direct continuation of MATH 350. After MATH 350. QR

MATH 3730b, Algebraic Number Theory Sam Raskin
Structure of fields of algebraic numbers (solutions of polynomial equations with integer coefficients) and their rings of integers; prime decomposition of ideals and finiteness of the ideal class group; completions and ramification; adeles and ideles; zeta functions. Prerequisites: MATH 310 and 370. QR

MATH 3800a, Algebra Ivan Loseu
The course serves as an introduction to commutative algebra and category theory. Topics include commutative rings, their ideals and modules, Noetherian rings and modules, constructions with rings, such as localization and integral extension, connections to algebraic geometry, categories, functors and functor morphisms, tensor product and Hom functors, projective modules. Other topics may be discussed at instructor's discretion. After MATH 350 and 370. QR

MATH 4210a / AMTH 4200a, The Mathematics of Data Science Staff
This course aims to be an introduction to the mathematical background that underlies modern data science. The emphasis is on the mathematics but occasional applications are discussed (in particular, no programming skills are required). Covered material may include (but is not limited to) a rigorous treatment of tail bounds in probability, concentration inequalities, the Johnson-Lindenstrauss Lemma as well as fundamentals of random matrices, and spectral graph theory. Prerequisite: MATH 305. QR, SC

MATH 4300a, Introduction to Topology Richard Kenyon
The theory of fundamental groups and covering spaces, with particular reference to two-dimensional manifolds. Prerequisites: MATH 350, and MATH 255 or 256 or 300 or 301. QR

MATH 4350b, Differential Geometry John Schotland
Applications of calculus to the study of the geometry of curves and surfaces in Euclidean space, intrinsic differential geometric properties of manifolds, and connections with non-Euclidean geometries and topology. Prerequisites: MATH 225 or 226 or 231, and MATH 255 or 256 or 230 or 250, and MATH 302 or permission of instructor. QR

MATH 4400a, Introduction to Algebraic Geometry Junliang Shen
Algebraic geometry is the study of algebraic varieties, which are the spaces described by zero sets of polynomial equations. This course is an introduction to algebraic geometry with a focus on algebraic curves. These are 1-dimensional varieties, which can also be viewed as Riemann surfaces, lying at the crossroads of many branches of mathematics. We develop the theory of algebraic curves including divisors, Hurwitz's theorem, Riemann-Roch theorem, Jacobians, and Abel-Jacobi theory. We also discuss some aspects of higher dimensional varieties. Prerequisites: MATH 310 and MATH 350. QR

MATH 4700a or b, Individual Studies Miki Havlickova
Individual investigation of an area of mathematics outside of those covered in regular courses, involving directed reading, discussion, and either papers or an examination. A written plan of study approved by the student's adviser and the director of undergraduate studies is required. The course may normally be elected for only one term.

MATH 4750a or b, Senior Essay Miki Havlickova
Interested students may write a senior essay under the guidance of a faculty member, and give an oral report to the department. Students wishing to write a senior essay should consult the director of undergraduate studies at least one semester in advance of the semester in which they plan to write the essay.

* **MATH 4800a or b, Senior Seminar: Mathematical Topics** Staff
A number of mathematical topics are chosen each term—e.g., differential topology, Lie algebras, mathematical methods in physics—and explored in one section of the seminar. Students give several presentations on the chosen topic. Available for credit only to seniors majoring in Mathematics, Economics and Mathematics, or Mathematics and Philosophy, for the purpose of fulfilling the senior requirement. Prior experience with mathematics courses at level 300 or higher is recommended.

* **MATH 4810b, Senior Seminar: Topics in Economics and Mathematics** Pei-Chun Su
A number of topics at the intersection of economics and mathematics are chosen each term—e.g., the theory of networks, market design and equilibrium, information economics and probability —and explored in the seminar. Students present several talks on the chosen topic. This section is devoted to topics of interest to majors in Economics or Mathematics majors, and in particular to students in the joint major Economics and Mathematics. The seminar is co-taught by a member of the Economics Department. Available for credit only to seniors majoring in Mathematics, Economics

and Mathematics, or Mathematics and Philosophy, for the purpose of fulfilling the senior requirement.

* **MATH 4820a / EDST 3820a, Senior Seminar: Math Education Topics** Miki Havlickova

The goal of the seminar is to explore topics of mathematics education at the college level, and work on presentation and teaching skills that can be useful in the classroom and in other settings. Everyone has several opportunities to practice teaching in the seminar, with guidance about explaining new material, choosing examples, implementing active learning strategies, and other skills. In other lessons, we discuss papers on pedagogy and classroom case studies. We also have sessions on public speaking, belonging in math, grading, and other topics relevant to mathematics instruction. The course is open to students in any major. It cannot be used as a mathematics elective. Seniors majoring in Mathematics or Mathematics + Philosophy may use the seminar to fulfill the senior requirement. In the pilot year, enrollment will be limited to 12 students, selected through an application process during April registration. MATH 225 or MATH 226, and MATH 255 or MATH 256

Mechanical Engineering (MENG)

MENG 1105a or b, Mechanical Design Staff

A course designed for potential majors in mechanical engineering, with units on design methodology, statics, mechanics of materials, and machining. Includes a design project. Prerequisite: physics at the level of PHYS 180, or permission of instructor. SC 0 Course cr

MENG 2050a or b, Computer-Aided Engineering Staff

Aspects of computer-aided design and manufacture (CAD/CAM). The computer's role in the mechanical design and manufacturing process; commercial tools for two- and three-dimensional drafting and assembly modeling; finite-element analysis software for modeling mechanical, thermal, and fluid systems. Prerequisite: ENAS 130 or permission of instructor. QR

MENG 2147b, Intermediate Mechanical Design Staff

This is a hands-on, project-based course in mechanical design. Students work on design projects that expose them to a variety of manufacturing techniques, including laser cutting, 3D printing, machining, and soldering. Completing these projects gives students the opportunity to hone many practical skills, including computer-aided design, parametric modeling, creating webpages, and programming microcontrollers. Throughout the semester, students create a design portfolio that showcases their projects. Prerequisite: MENG 185.

MENG 2311a, Mechanical Engineering I: Strength and Deformation of Mechanical Elements Staff

Elements of statics; mechanical behavior of materials; equilibrium equations, strains and displacements, and stress-strain relations. Elementary applications to trusses, bending of beams, pressure vessels, and torsion of bars. Prerequisites: PHYS 180 or 200, and MATH 115. QR, SC RP

MENG 2511a or b, Thermodynamics for Mechanical Engineers Staff

Study of energy and its transformation and utilization. First and Second Laws for closed and open systems, equations of state, multicomponent nonreacting systems,

auxiliary functions (H, A, G), and the chemical potential and conditions of equilibrium. Engineering devices such as power and refrigeration systems and their efficiencies. Prerequisites: PHYS 180 or 200, and MATH 115. QR, SC

MENG 2615a, Introduction to Materials Science Jan Schroers
Study of the atomic and microscopic origin of the properties of engineering materials: metals, glasses, polymers, ceramics, and composites. Phase diagrams; diffusion; rates of reaction; mechanisms of deformation, fracture, and strengthening; thermal and electrical conduction. Prerequisites: elementary calculus and background in basic mechanics (deformation, Hooke's law) and structure of atoms (orbitals, periodic table). QR, SC RP

MENG 2616La or b, Solid Mechanics and Materials Science Laboratory Staff
This course introduces undergraduate students to a variety of microstructure characterization and mechanical testing techniques for engineering materials. It offers hands-on laboratory projects that enable students to investigate the relationship between the mechanical behavior of materials and their microstructure. Topics include bending and hardness tests, processing of materials, and fracture. The course uses several characterization methods, including scanning electron microscopy, atomic force microscopy, x-ray diffraction, differential scanning calorimetry, nanomechanical testing, and tensile testing. Prerequisite: MENG 285 SC RP 0 Course cr

MENG 3020Lb, Mechatronics Laboratory Madhusudhan Venkadesan
Hands-on synthesis of control systems, electrical engineering, and mechanical engineering. Review of Laplace transforms, transfer functions, software tools for solving ODEs. Review of electronic components and introduction to electronic instrumentation. Introduction to sensors; mechanical power transmission elements; programming microcontrollers; PID control. Prerequisites: ENAS 194 or equivalent, ENAS 130, and EENG 200; or permission of instructor. QR RP

* **MENG 3125a, Machine Elements and Manufacturing Processes** Staff
This course provides students a working knowledge of two fundamental topics related to mechanical design: machine elements and manufacturing processes. *Machine elements* refer one or more of a range of common design elements that transmit power and enable smooth and efficient motion in mechanical systems with moving parts. This course introduces the most common of these elements and gives students the tools to systems design with them. Topics include common linkages, gearing, bearings, springs, clutches, brakes, and common actuators such as DC motors. *Manufacturing processes* are necessary for the mechanical design engineer to effectively perform her or his duties; they provide an understanding of how the parts and systems that they design are fabricated, allowing "Design for Manufacturing" principles to be taken into account in the product development process. Students learn the basics of common commercial manufacturing processes for mechanical systems, including low-volume processes such as machining to high-volume processes such as casting (metal parts), molding (plastic parts), and stamping (sheet metal parts). Prerequisites: Extensive CAD experience. MENG 185 and MENG 280 recommended.

MENG 3323b, Mechanical Engineering III: Dynamics Staff
Kinematics and dynamics of particles and systems of particles. Relative motion; systems with constraints. Rigid body mechanics; gyroscopes. Prerequisites: PHYS 180 or 200, and MATH 120 or ENAS 151. QR, SC

MENG 3422a, Mechanical Engineering II: Fluid Mechanics Mitchell Smooke
Mechanical properties of fluids, kinematics, Navier-Stokes equations, boundary conditions, hydrostatics, Euler's equations, Bernoulli's equation and applications, momentum theorems and control volume analysis, dimensional analysis and similitude, pipe flow, turbulence, concepts from boundary layer theory, elements of potential flow. Prerequisites: ENAS 194 or equivalent, and physics at least at the level of PHYS 180. QR, SC RP

* **MENG 3423Lb, Fluid Mechanics and Thermodynamics Laboratory** Staff
Hands-on experience in applying the principles of fluid mechanics and thermodynamics. Integration of experiment, theory, and simulation to reflect real-world phenomena. Students design and test prototype devices. Prerequisites: MENG 211 and 361. WR, SC 0 Course cr

MENG 3424b, Mechanical Engineering IV: Fluid and Thermal Energy Science Amir Pahlavan
Fundamentals of mechanical engineering applicable to the calculation of energy and power requirements, as well as transport of heat by conduction, convection, and radiation. Prerequisites: MENG 211, 361, and ENAS 194; or permission of instructor. QR, SC

MENG 3465a, Chemical Propulsion Systems Alessandro Gomez
Study of chemical propulsion systems. Topics include review of propulsion fundamentals; concepts of compressible fluid flow; development and application of relations for Fanno and Rayleigh flows; normal and oblique shock systems to various propulsion system components; engine performance characteristics; fundamentals of turbomachinery; liquid and solid rocket system components and performance. Prerequisite: MENG 361 or permission of instructor. QR, SC RP

MENG 3675b, Thermodynamics, Kinetics, and Structure of Materials Jan Schroers
This advanced-level course focuses on the thermodynamic and kinetic aspects of materials and how they define structure and properties. We first discuss thermodynamics relevant to materials. This includes thermodynamic laws, auxiliary functions to develop convenient equations of state to describe equilibrium, Gibbs Free Energy (G), experimental determination of G, model calculations of G such as ideal solutions and regular solutions, using G curves to construct equilibrium conditions, phase diagram constructions, reading of phase diagrams. We then focus on solidification which we develop from the phenomena of undercooling, nucleation and growth. Combining both, allows us to predict microstructures formed during solidification far and close to equilibrium. We also discuss glass formation, the case when nucleation and growth can be suppressed, and the liquid freezes upon cooling into a glass. Prerequisite: MENG 285. 0 Course cr

MENG 4041b / ENAS 4041, Applied Numerical Methods for Differential Equations Beth Anne Bennett
The derivation, analysis, and implementation of numerical methods for the solution of ordinary and partial differential equations, both linear and nonlinear. Additional topics such as computational cost, error estimation, and stability analysis are studied in several contexts throughout the course. Prerequisites: MATH 115, and 222 or 225, or equivalents; ENAS 130 or some knowledge of Matlab, C++, or Fortran programming; ENAS 194 or equivalent. ENAS 440 is not a prerequisite. QR

MENG 4137La, Mechanical Design: Process and Implementation I Staff
This course is the first half of the capstone design sequence (students take MENG 488 in the spring semester of the same academic year) and is a unique opportunity to apply and demonstrate broad and detailed knowledge of engineering in a team effort to design, construct, and test a functioning engineering system. The lecture portion of the class provides guidance in planning and managing your project, as well other topics associated with engineering design. This course sequence requires quality design; analyses and experiments to support the design effort; and the fabrication and testing of the engineered system; as well as proper documentation and presentation of results to a technical audience. Prerequisites: MENG 280, MENG 325, MENG 361. MENG 185 and MENG 390 are strongly suggested. RP

MENG 4138Lb, Mechanical Design: Process and Implementation II Staff
This course is the second half of the capstone design sequence (students take MENG 487 in the fall semester of the same academic year) and is a unique opportunity to apply and demonstrate broad and detailed knowledge of engineering in a team effort to design, construct, and test a functioning engineering system. The lecture portion of the class provides guidance in planning and managing your project, as well other topics associated with engineering design. This course sequence requires quality design; analyses and experiments to support the design effort; and the fabrication and testing of the engineered system; as well as proper documentation and presentation of results to a technical audience. Prerequisites: MENG 487, MENG 280, and MENG 361. MENG 185 and MENG 325 are strongly suggested. ½ Course cr

MENG 4145b, Advanced Design and Analysis of Machines Staff
There are many useful, classic mechanisms that require a single actuator to operate. These include four-bar mechanisms, slider-cranks, cam-followers, and scotch-yokes. In this course, students learn to design (synthesize) classic mechanisms. They also learn how to analyze the kinematics and kinetics of important machines. While systems based on single actuators are common, the course then introduces the dynamics of multiple degree-of-freedom machines such as robotic actuators. This course focuses on planar systems and students learn to write equations of motion of robots that can roll forward with multiple articulating linkages. Students design and analyze using SolidWorks and solve equations with Matlab. A project is designed, analyzed, built, and tested utilizing a microcontroller and 3D printer. Prerequisites: ENAS 130, MENG 325.

MENG 4154b / BENG 4104b, Medical Device Design and Innovation Daniel Wiznia and Steven Tommasini
The engineering design, project planning, prototype creation, and fabrication processes for medical devices that improve patient conditions, experiences, and outcomes. Students develop viable solutions and professional-level working prototypes to address clinical needs identified by practicing physicians. Some attention to topics such as intellectual property, the history of medical devices, documentation and reporting, and regulatory affairs. 0 Course cr

MENG 4273b, Introduction to Soft Robotics Rebecca Kramer-Bottiglio
An introduction to soft robotics. Course topics include: robot kinematics, soft robot fabrication and design, conductive composites, soft and stretchable sensors, variable stiffness materials, responsive material actuators, simple controllers, elastic materials

models, and soft robot simulation. The course also includes a semester-long soft robotics design project or literature review.

MENG 4359a / BENG 4559, Neuromuscular Biomechanics Madhusudhan Venkadesan
Mechanics and control of animal movement, including skeletal muscle mechanics, systems-level neural and sensory physiology, elements of feedback control, and optimal control. Deriving equations of motion for multibody mechanical systems that are actuated by muscles or muscle-like motors; incorporating sensory feedback; analyzing system properties such as stability and energetics. Prerequisites: MENG 383 and MATH 222 or equivalents, and familiarity with MATLAB or a similar scientific computing environment. QR RP

MENG 4370b / BENG 4570b, Computational Mechanics Martin Pfaller
This course integrates fundamental concepts from nonlinear continuum mechanics and finite element methods applied to solid and fluid mechanics, focusing on theoretical understanding and numerical techniques. Topics covered are fundamentals of tensor calculus, kinematics, balance equations, constitutive relationships, geometric and material nonlinearities, nonlinear solution strategies, stability, nonlinear dynamics, errors, convergence, and adaptivity. Applications in biomedical engineering are stressed throughout the course. Fundamentals in calculus, differential equations, and linear algebra.

* **MENG 4469a, Aerodynamics** Juan de la Mora
Review of fluid dynamics. Inviscid flows over airfoils; finite wing theory; viscous effects and boundary layer theory. Compressible aerodynamics: normal and oblique shock waves and expansion waves. Linearized compressible flows. Some basic knowledge of thermodynamics is expected. Prerequisite: MENG 361 or permission of instructor. QR, SC

MENG 4475a / ENAS 475, Fluid Mechanics of Natural Phenomena Amir Pahlavan
This course draws inspiration from nature and focuses on utilizing the fundamental concepts of fluid mechanics and soft matter physics to explain these phenomena. We study a broad range of problems related to i) nutrient transport in plants, slime molds, and fungi and the adaptation of their networks in dynamic environments, ii) collective behavior and chemotaxis of swimming microorganisms, and iii) pattern formation in nature, e.g. icicles, mud cracks, salt polygons, dendritic crystals, and Turing patterns. We also discuss how our understanding of these problems could be used to develop sustainable solutions for the society, e.g. designing synthetic trees to convert CO_2 to oxygen, developing micro/nano robots for biomedical applications, and utilizing pattern formation and self-assembly to make new materials. Prerequisite: MENG 361.

MENG 4664b, Forces on the Nanoscale Udo Schwarz
Modern materials science often exploits the fact that atoms located at surfaces or in thin layers behave differently from bulk atoms to achieve new or greatly altered material properties. The course provides an in-depth discussion of intermolecular and surface forces, which determine the mechanical and chemical properties of surfaces. In the first part, we discuss the fundamental principles and concepts of forces between atoms and molecules. Part two generalizes these concepts to surface forces. Part three then gives a variety of examples. The course is of interest to students studying thin-film growth, surface coatings, mechanical and chemical properties of surfaces, soft matter

including biomembranes, and colloidal suspensions. Some knowledge of basic physics, mathematics, chemistry, and thermodynamics is expected. SC o Course cr

MENG 4672b, Electronic and Optical Properties of Energy Materials Diana Qiu
This class explores the electronic and optical properties of materials from the perspective of electronic and molecular structure with a special focus on the microscopic origin and design of properties of interest for energy harvesting, storage, and transport. The course starts by briefly introducing concepts in quantum mechanics, such as wavefunctions and the time-independent Schrodinger equations. Then, we explore electronic structure in the context of designing materials for energy harvesting and generation, such as photovoltaics, thermoelectrics, and piezoelectrics. We also study dynamical processes, such as hot electron relaxation, multi-exciton generation, charge transport, and energy transport at a phenomenological level. Finally, we overview common energy storage materials, with a focus on solid-state batteries and solar fuels. Prerequisite: MENG 285, ENAS 151, or permission of instructor QR, SC

MENG 4673a, Introduction to Nanomaterials and Nanotechnology Cong Su
Survey of nanomaterial synthesis methods and current nanotechnologies. Approaches to synthesizing nanomaterials; characterization techniques; device applications that involve nanoscale effects. Prerequisites: ENAS 194 and MENG 285, or permission of instructor. SC

* **MENG 4774b / BENG 4724b, Topics in Computational and Systems Biology** Purushottam Dixit
This course covers topics related to modeling biological networks across time and length scales. Specifically, the course covers models of intracellular signaling networks, transcriptional regulation networks, cellular metabolic networks, and ecological networks in microbial consortia. For each type of network, we cover the biological basics, standard mathematical treatments including deterministic and stochastic modeling, methods to infer model parameters from data, and new machine-learning based inference approaches. The required mathematical methods are briefly covered. The course assignments involve coding in MATLAB. Prerequisite: MATH 120 or ENAS 151.

* **MENG 4991a or b, Special Projects I** Staff
Faculty-supervised one- or two-person projects with emphasis on research (experiment, simulation, or theory), engineering design, or tutorial study. Students are expected to consult the course instructor, director of undergraduate studies, and/or appropriate faculty members to discuss ideas and suggestions for topics. Focus on development of professional skills such as writing abstracts, prospectuses, and technical reports as well as good practices for preparing posters and delivering presentations. Permission of advisor and director of undergraduate studies is required. Students are required to attend a 75-minute section once per week.

* **MENG 4992a or b, Special Projects II** Staff
Faculty-supervised one- or two-person projects with emphasis on research (experiment, simulation, or theory), engineering design, or tutorial study. Students are expected to consult the course instructor, director of undergraduate studies, and/or appropriate faculty members to discuss ideas and suggestions for topics. These courses may be taken at any time during the student's career and may be taken more than once.

Prerequisites: MENG 471 or 472; permission of adviser and director of undergraduate studies.

Modern Greek/Hellenic Studies (MGRK)

MGRK 1200b / HELN 1200b, Elementary Modern Greek II Maria Kaliambou
Continuation of MGRK 110. Prerequisite: MGRK 110. L2 1½ Course cr

* **MGRK 1400b / HELN 1400b, Intermediate Modern Greek II** Maria Kaliambou
Further development of listening, speaking, reading, and writing skills in modern Greek. Presentation of short research projects related to modern Greece. Prerequisite: MGRK 130 or equivalent. L4 1½ Course cr

Modern Middle East Studies (MMES)

* **MMES 1121a / PLSC 3107a, International Relations of the Middle East** Katherine Ingram
In this course, students develop the tools needed to understand contemporary international relations between the states of the Middle East and North Africa. The course focuses on two fundamental aspects of politics: historical context and strategic incentives. Most weeks focus on major events in a specific country or subregion, developing a historical background for that area and for how those events shaped the region more broadly. We also discuss broader topics that affect the region as a whole, including sectarianism, oil wealth, violent non-state actors, and extraregional powers. SO

MMES 1149a / ER&M 2519a / HIST 1219a / JDST 200 / JDST 2000a / RLST 1480a, Jews and the World: From the Bible through Early Modern Times Ivan Marcus
A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings. Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP 0 Course cr

* **MMES 1152a / PERS 1500a, Thematic Survey of Modern Persian Literature** Farkhondeh Shayesteh
A content-base advanced course focusing on continuing development of language skills for nonnative speakers. Emphasis on reading, writing, and discussion through modern Persian literary prose and poetry. PERS 1400 and permission from the instructor. L5, HU

* **MMES 1157b / JDST 3060b / NELC 1570b / NELC 157b and NELC 1570b, Israeli Narratives** Shiri Goren
This course looks at contemporary representations of social, political, and domestic space in Israel through cultural production such as literature, visual work, and art. It focuses on close reading of major Israeli works in translation with attention to how their themes and forms relate to the Israeli condition. Reading and viewing include: Amos Oz's major novel A Tale of Love and Darkness, *Anne Frank: The Graphic Diary*, Maya Arad's novella "The Hebrew Teacher," TV show *Arab Labor* and writing by Yehudah Amichai, Etgar Keret, and Sayed Kashua, among others. We discuss topics

and theories of personal and collective identity formation, war and peace, ethnicity and race, migration, nationalism, and gender. No knowledge of Hebrew required. WR, HU

* **MMES 1159a / HEBR 1510a / JDST 4209, Conversational Hebrew: Israeli Media** Shiri Goren

An advanced Hebrew course for students interested in practicing and enhancing conversational skills. Focus on listening comprehension and on various forms of discussion, including practical situations, online interactions, and content analysis. Prerequisite: HEBR 1400 or permission of instructor. L5

* **MMES 1162b / HEBR 1690b / JDST 4203 / LING 1650b, Languages in Dialogue: Hebrew and Arabic** Dina Roginsky

Hebrew and Arabic are closely related as sister Semitic languages. They have a great degree of grammatical, morphological, and lexical similarity. Historically, Arabic and Hebrew have been in cultural contact in various places and in different aspects. This advanced Hebrew language class explores linguistic similarities between the two languages as well as cultural comparisons of the communities, built on mutual respect. Students benefit from a section in which they gain a basic exposure to Arabic, based on its linguistic similarity to Hebrew. Conducted in Hebrew. Prerequisite: HEBR 1400, or placement test, or permission of the instructor. L5, HU RP

* **MMES 1164b / CPLT 4730b, Politics and Literature in the Middle East** Robyn Creswell

This course considers the relationship between literature and politics in Turkey, Iran, and the Arab world since the late 19th century. We read novels, short stories, poetry, essays, play scripts, and comics, and watch movies, while situating them in their artistic and political contexts. This course considers the ways that an artwork can intervene in the political debates of its time, while taking seriously the distinctive modes of political thought that are possible only through art. Topics include gender relations, the legacies of European colonialism, modernization and modernism, revolutionary movements, the role of religion in society, experiences of violence and trauma, and the drastic changes to Middle Eastern societies wrought by the oil boom. All readings are in English translation, but if sufficient students with relevant language skills enroll, an additional biweekly session may be arranged for selected course readings in the original languages. HU

* **MMES 1167b / HEBR 1640b / JDST 4217, Biblical to Modern Hebrew for Reading Knowledge** Dina Roginsky

Instruction in the linguistic needs of students who have reading knowledge of Biblical Hebrew but cannot read or converse in Modern Hebrew. Concentration on reading comprehension of Modern Hebrew for research purposes, particularly scholarly texts tailored to students' areas of interest. Two years of Biblical or Modern Hebrew studies, or permission of the instructor. RP

* **MMES 2237a / CPLT 4230a, Politics and Literature in Modern Iran and Afghanistan** Homeira Qadari

This course traces the emergence of modern Persian literature in Iran and Afghanistan, introducing the contemporary poets and writers of fiction who created this new literary tradition in spite of political, social, state, and religious constraints. Our readings include Iranian novelists working under censorship, Afghan memoirists describing their experience in a warzone, and even contemporary writers living in exile in the US

or Europe. Major writers include Mohammad Ali Jamalzadeh, Sadegh Hedayat, Simin Behbahani, Forugh Farrokhzad, Homeira Qaderi (who will visit the class), and Khaled Hosseini. HU

* **MMES 3312b / CPLT 1960b / JDST 3812b / NELC 3230b / NELC 323b and NELC 3230b, Hebrew Poetry in Muslim Spain** Peter Cole

Introduction to the Golden Age of Hebrew poetry in Muslim Andalusia from the tenth century through the twelfth. Major figures of the period and the cultural and philosophical questions they confronted. The Judeo-Arabic social context in which the poetry emerged; critical issues pertaining to the study and transmission of this literature. Readings from the works of several poets. Readings in translation. Additional readings in Hebrew available. HU

* **MMES 3321b / ANTH 3821b / SOCY 3433b / WGSS 3321b, Middle East Gender Studies** Marcia Inhorn

The lives of women and men in the contemporary Middle East explored through a series of anthropological studies and documentary films. Competing discourses surrounding gender and politics, and the relation of such discourse to actual practices of everyday life. Feminism, Islamism, activism, and human rights; fertility, family, marriage, and sexuality. SO

* **MMES 3342a / HIST 3232a / HUMS 4430a / JDST 3270a / RLST 2010a, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

* **MMES 4430b / ANTH 441 / ANTH 4841b / WGSS 4430b, Gender and Citizenship in the Middle East** Eda Pepi

This seminar explores the complex interplay between gender, sexuality, and citizenship in the Middle East and North Africa. We examine how they are both shaped by and shape experiences of nationality, migration, and statelessness. Highlighting how gender and sexual minorities, and the gendered regulation of life, more broadly, both animate and contest colonial legacies tied to a racialized notion of "modernity." Through ethnography, history, and literature, students confront a political economy of intimacies that continuously reshape what it means to be or not to be a citizen. Our approach extends beyond borders and laws to include the everyday acts of citizenship that rework race, religion, and ethnicity across transnational fronts. We discuss how people navigate their lives in the everyday, from the ordinary poetry of identity and belonging to the spectacular drama of war and conflict. Our goal is to challenge orientalist legacies that dismiss theoretical insights from scholarship on and from this region by labeling it as focused on exceptional cases instead of addressing "universal" issues. Instead, we take seriously that the specific historical and social contexts of the Middle East and North Africa reveal how connections based on gender and sexuality within and across families and social classes are deeply entwined with racial narratives of state authority and political sovereignty on a global scale. SO

* **MMES 4465b / ARBC 1650b, Arabic Seminar: Early Adab** Kevin van Bladel
Study and interpretation of classical Arabic texts for advanced students. The subtitle of this course changes depending on the materials covered. This term the course focuses on "Early Adab." Prerequisite: ARBC 1460, 1510, or permission of instructor. May be repeated for credit.

Modern Tibetan (MTBT)

View Courses

Molecular Biophysics and Biochemistry (MB&B)

MB&B TBD-3a, Seminar in Molecular Cell Biology Min Wu
A graduate-level seminar in modern cell biology. The class is devoted to the reading and critical evaluation of classical and current papers. The topics are coordinated with the CBIO 602 lecture schedule. Thus, concurrent enrollment in CBIO 602 is required. Prerequisites: Any undergraduates wishing to enroll must have already taken MCDB 205. In addition, undergraduates are strongly encouraged to reach out to the course directors prior to enrollment.

* **MB&B 0500b, Topics in Cancer Biology** Sandy Chang
Introduction to cancer as a genetic disease, with a focus on major discoveries in cancer biology that offer mechanistic insights into the disease process. A brief history of cancer; influence of the genomic revolution on cancer diagnostics; molecular defects underlying specific cancers; current and future cancer therapeutics. Patient case studies highlight specific molecular pathways and treatment strategies. Enrollment limited to first-year students with a strong background in biology and/or chemistry, typically demonstrated by a score of 5 on Advanced Placement examinations. WR, SC

MB&B 1050a or b / MCDB 1050a or b, Biology, the World, and Us Staff
This course is for non-science majors who wish to gain an understanding of modern biology by examining the scientific basis of current issues. We'll consider issues related to: i) pandemics and global infectious disease; ii) the climate crisis; iii) the future of genetics and the new green revolution. Many of the topics have an increasingly large impact on our daily lives. The issues are both social and biological, and it's crucial that social debate be based on a clear understanding of the underlying science. The instructors will explain the scientific foundation beneath each issue. We'll emphasize the nature of science as a process of inquiry rather than a fixed body of terminology and facts. The course is not intended to be a comprehensive survey of biology. SC
o Course cr

* **MB&B 1070b / EDST 107 / EDST 3107b / PHYS 1070b, Being Human in STEM** Staff
A collaboratively designed, project-oriented course that seeks to examine, understand, and disseminate how diversity of gender, race, religion, sexuality, economic circumstances, etc. shape the STEM experience at Yale and nationally, and that seeks to formulate and implement solutions to issues that are identified. Study of relevant peer-reviewed literature and popular-press articles. OpEd writing project and design and implementation of an intervention project focusing on improving belonging in Yale STEM communities. SO

* **MB&B 1210La / PHYS 1210La, Introduction to Physics in Living Systems I: Observation and Analysis** Staff
A hands-on introduction to the physics that enables life and human measurement of living things. This lab builds student knowledge of scientific experimental design and practice. Topics include detection of light, basic circuit building, sterile technique in biology and physics, data collection with student-built instrumentation, and quantitative assessment. For students choosing to major in MB&B, this course may be used to fulfill the MB&B requirement for *Practical Skills* in physics. There are no prerequisites to this ½ credit class and it is helpful to take it in the same semester as MB&B 122L. Priority is given to first-year students looking to fulfill medical school application requirements and students seeking to join research labs at Yale. SC o Course cr

* **MB&B 1220La / PHYS 1220La, Introduction to Physics in Living Systems: Observation and Analysis II** Staff
A hands-on introduction to the physics that enables life and human measurement of living things. This lab builds student knowledge of scientific experimental design and practice, focusing on building models from experimental data. Topics included electrical circuits, magnetism, data collection with student-built instrumentation, and quantitative assessment. For students choosing to major in MB&B, this course may be used to fulfill the MB&B requirement for Practical Skills in physics. Previously MB&B 122L. Taking MB&B/PHYS 1210L before this class is required, as the material builds on itself. Priority is given to first-year students looking to fulfill medical school application. o Course cr

* **MB&B 1230Lb / PHYS 1230Lb and PHYS 123Lb / PHYS 123Lb, Introduction to Physics in Living Systems III: Mechanics** Andrew Miranker
A hands-on introduction to the physics that enables life and human measurement of living things. The course focuses on the principles of mechanics at work in the biological sciences. This lab builds student knowledge, centering diffusion as an emergent phenomenon from elastic collisions, from which statistical mechanics is introduced. For students choosing to major in MB&B, this course may be used to fulfill the MB&B requirement for *Practical Skills* in physics. Priority for this 1/2 credit course is given to first-year students looking to fulfill medical school application requirements. It is helpful to take this course in the same semester as MB&B 124L. ½ Course cr

* **MB&B 1240Lb / PHYS 1240Lb, Introduction to Physics in Living Systems Laboratory IV: Electricity, Magnetism, and Radiation** Andrew Miranker
Introduction to the physics that enables life and human measurement of living things. This lab introduces principles of electricity, magnetism, light and optics at work in the biological sciences. The syllabus emphasizes electric dipoles as a model for biomolecules, electric fields such as those across cell membranes, electric current, and magnetic fields. Light is developed in terms of electromagnetic radiation, ray optics and photons. The interaction of light with biomolecules to understand basic biological research and medical diagnostics are also covered. For students choosing to major in MB&B, this course may be used to fulfill the MB&B requirement for *Practical Skills* in physics. There are no prerequisites to this ½ credit class and it is helpful to take it in the same semester as MB&B 123L. May not be taken after PHYS 166L. Priority is given to first-year students looking to fulfill medical school application requirements and students seeking to join research labs at Yale. SC o Course cr

* **MB&B 2000a or b / MCDB 3000a or b, Biochemistry** Staff
An introduction to the biochemistry of animals, plants, and microorganisms, emphasizing the relations of chemical principles and structure to the evolution and regulation of living systems. Introductory biology coursework (BIOL 101, BIOL 102, BIOL 103) or equivalent performance on the corresponding biological sciences placement examination; one term of organic chemistry (CHEM 174 or CHEM 220); or with permission of instructor. Note for MB&B majors: this course does not substitute for MB&B 300 and MB&B 301. SC 0 Course cr

* **MB&B 2510La or b / MCDB 3010La or b, Laboratory for Biochemistry** Ghazia Abbas
An introduction to current experimental methods in molecular biology, biophysics, and biochemistry. Limited enrollment. Prerequisite: BIOL 101. SC ½ Course cr

MB&B 2750a, Biology at the Molecular Level Enrique De La Cruz and Allison Didychuk
An introductory course for students to learn the key concepts from physics and physical chemistry that govern the structure and function of biomolecules in biology and medicine. Emphasis is placed on atomic-scale biomolecular motions, energy, reaction rates and mechanisms; core elements that underpin the exquisite specificity and regulated control of life processes. This course prepares students for upper level course content where these concepts are revisited. Connections to medicine and research are made through the use of practical examples, laboratory-based activities and training in biologically relevant areas of math, statistics and computer programming. This course is open to all Yale students. For MB&B majors, this course is accepted as fulfillment of one semester of MB&B's two-semester requirement in physical chemistry. Prerequisites: BIOL 101–102, MATH 112 (or equivalent), college level General Chemistry, and high school Physics. SC

MB&B 3000a, Principles of Biochemistry I Staff
Discussion of the physical, structural, and functional properties of proteins, lipids, and carbohydrates, three major classes of molecules in living organisms. Energy metabolism and hormone signaling as examples of complex biological processes whose underlying mechanisms can be understood by identifying and analyzing the molecules responsible for these phenomena. Prerequisites: After BIOL 101 and CHEM 174 or CHEM 220. SC 0 Course cr

MB&B 3010b, Principles of Biochemistry II Christian Schlieker and Franziska Bleichert
Building on the principles of MB&B 300 through study of the chemistry and metabolism of DNA, RNA, and proteins. Critical thinking emphasized by exploration of experimental methods and data interpretation, from classic experiments in biochemistry and molecular biology through current approaches. Prerequisite: MB&B 300 or permission of instructor. SC

MB&B 3300a and MB&B 3310a / BENG 3230a / MCDB 3310a / NSCI 3240a, Modeling Biological Systems I Thierry Emonet and Kathryn Miller-Jensen
Biological systems make sophisticated decisions at many levels. This course explores the molecular and computational underpinnings of how these decisions are made, with a focus on modeling static and dynamic processes in example biological systems. This course is aimed at biology students and teaches the analytic and computational methods

needed to model genetic networks and protein signaling pathways. Students present and discuss original papers in class. They learn to model using MatLab in a series of in-class hackathons that illustrate the biological examples discussed in the lectures. Biological systems and processes that are modeled include: (i) gene expression, including the kinetics of RNA and protein synthesis and degradation; (ii) activators and repressors; (iii) the lysogeny/lysis switch of lambda phage; (iv) network motifs and how they shape response dynamics; (v) cell signaling, MAP kinase networks and cell fate decisions; and (vi) noise in gene expression. Prerequisites: MATH 115 or 116. BIOL 101–104, or with permission of instructors. This course also benefits students who have taken more advanced biology courses (e.g. MCDB 200, MCDB 310, MB&B 300/301). QR, SC 0 Course cr per term

MB&B 3520b / MCDB 3520 / S&DS 3520b, Biomedical Data Science, Mining and Modeling Mark Gerstein and Matthew Simon

Techniques in data mining and simulation applied to bioinformatics, the computational analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. Sequence alignment, comparative genomics and phylogenetics, biological databases, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, microarray normalization, and machine-learning approaches to data integration. Prerequisites: MB&B 301 and MATH 115, or permission of instructor. SC 0 Course cr

* **MB&B 3640a / MCDB 3640a, Light Microscopy: Techniques and Image Analysis** Joseph Wolenski and Jonathon Howard

A rigorous study of principles and pertinent modalities involved in modern light microscopy. The overall course learning objective is to develop competencies involving advanced light microscopy applications common to multidisciplinary research. Laboratory modules coupled with critical analysis of pertinent research papers cover all major light microscope methods—from the basics (principles of optics, image contrast, detector types, fluorescence, 1P and 2P excitation, widefield, confocal principle, TIRF), to more recent advances, including: superresolution, lightsheet, FLIM/FRET, motion analysis and force measurements. This course is capped at 8 students to promote interactions and ensure a favorable hands-on experience. Priority for enrollment is given to students who are planning on using these techniques in their independent research. Prerequisites: MCDB 205, PHYS 170/171 or above, either CHEM 161/165 or above; with CHEM 134L, 136L or permission from the instructor. SC

MB&B 3650b / EVST 3650b, Biochemistry and Our Changing Climate Karla Neugebauer

Climate change is impacting how cells and organisms grow and reproduce. Imagine the ocean spiking a fever: cold-blooded organisms of all shapes, sizes and complexities struggle to survive when water temperatures go up 2–4 degrees. Some organisms adapt to extremes, while others cannot. Predicted and observed changes in temperature, pH and salt concentration do and will affect many parameters of the living world, from the kinetics of chemical reactions and cellular signaling pathways to the accumulation of unforeseen chemicals in the environment, the appearance and dispersal of new diseases, and the development of new foods. In this course, we approach climate change from the molecular point of view, identifying how cells and organisms—from microbes to plants and animals—respond to changing environmental conditions. To embrace the concept of "one health" for all life on the planet, this course leverages biochemistry,

cell biology, molecular biophysics, and genetics to develop an understanding of the impact of climate change on the living world. We consider the foundational knowledge that biochemistry can bring to the table as we meet the challenge of climate change. Prerequisites: MB&B 300/301 or MB&B 200/MCDB 300 or permission of the instructor. Can be taken concurrently with MB&B 301. SC 0 Course cr

MB&B 4200a, Macromolecular Structure and Biophysical Analysis Yong Xiong, Jonathon Howard, Steven Tang, and Franziska Bleichert
Analysis of macromolecular architecture and its elucidation using modern methods of structural biology and biochemistry. Topics include architectural arrangements of proteins, RNA, and DNA; practical methods in structural analysis; and an introduction to diffraction and NMR. Prerequisites: MBB 301 and 302. SC

* **MB&B 4250a / MCDB 4250a, Basic Concepts of Genetic Analysis** Jun Lu
The universal principles of genetic analysis in eukaryotes. Reading and analysis of primary papers that illustrate the best of genetic analysis in the study of various biological issues. Focus on the concepts and logic underlying modern genetic analysis. Prerequisite: MCDB 202 or pre-approval of instructor. SC

MB&B 4350a, Quantitative Methods in Biology Nikhil Malvankar, Julien Berro, and Yong Xiong
An introduction to quantitative methods relevant to analysis and interpretation of biological data. Topics include statistical testing, data presentation, and error analysis; introduction to artificial intelligence-based data analysis tools, Alpha Fold Tutorial, introduction to mathematical modeling of biological dynamics; and Fourier analysis in signal/image processing and macromolecular structural studies. Instruction in basic programming skills and data analysis using MATLAB; study of real data from MB&B research groups. Prerequisites: MATH 120 and MB&B 300 or equivalents, or with permission of instructors. QR, SC

MB&B 4430b, Advanced Eukaryotic Molecular Biology Mark Hochstrasser, Wendy Gilbert, Matthew Simon, and Franziska Bleichert
Selected topics in regulation of chromatin structure and remodeling, mRNA processing, mRNA stability, translation, protein degradation, DNA replication, DNA repair, site-specific DNA recombination, and somatic hypermutation. Prerequisites: MB&B 300 and 301, or permission of instructor. SC

* **MB&B 4450b, Methods and Logic in Molecular Biology** Candie Paulsen and Julien Berro
An examination of fundamental concepts in molecular biology through analysis of landmark papers. Development of skills in reading the primary scientific literature and in critical thinking. Prerequisites: MB&B 300 and 301. SC

MB&B 4490a, Medical Impact of Basic Science Joan Steitz, Abhijit Patel, George Miller, Andrew Miranker, David Schatz, Sandy Chang, Allison Didychuk, and Daniel DiMaio
Examples of recent discoveries in basic science that have elucidated the molecular origins of disease or that have suggested new therapies for disease. Readings from the primary scientific and medical literature, with emphasis on developing the ability to read this literature critically. Prerequisites: MB&B 300 and 301 or equivalents, or permission of instructor. SC

* **MB&B 4590a / ENGL 4459a / EVST 4469a, Writing about Science, Medicine, and the Environment** Carl Zimmer
Advanced non-fiction workshop in which students write about science, medicine, and the environment for a broad public audience. Students read exemplary work, ranging from newspaper articles to book excerpts, to learn how to translate complex subjects into compelling prose. Admission by permission of the instructor only. Applicants should email the instructor at carl@carlzimmer.com with the following information: 1. One or two samples of nonacademic, nonfiction writing. (No fiction or scientific papers, please.) Indicate the course or publication, if any, for which you wrote each sample. 2. A note in which you briefly describe your background (including writing experience and courses) and explain why you'd like to take the course. Formerly ENGL 459. WR

* **MB&B 4700a or b, Research in Biochemistry and Biophysics for the Major I** Staff
Individual laboratory projects under the supervision of a faculty member. Students must submit an enrollment form that specifies the research supervisor by the date that course schedules are due. Students are expected to commit at least ten hours per week to working in a laboratory. Written assignments include a research proposal, due near the beginning of the term, and a research report that summarizes experimental results, due before the beginning of the final examination period. Students receive a letter grade. Up to 2 credits of MB&B 470/471 may be counted toward the MB&B major requirements. Enrollment limited to MB&B majors. Prerequisite: MB&B 251L or permission of the instructor.

* **MB&B 4900a or b, The Senior Literature Essay** Christian Schlieker
This course fulfills the MB&B senior requirement for BA/BS majors and may taken in either the fall or spring term of senior year. Students complete an independent project by reading primary literature and writing a critical review on a topic chosen by the student in any area of molecular biophysics and biochemistry. The chosen topic cannot draw directly on the student's research experiences while enrolled at Yale. For topics drawing directly from a student's research experience, students should enroll in MB&B 491: Senior Research Essay. The course structure first assists the student to identify a topic and then identifies a member of the MB&B faculty with appropriate expertise. The member of faculty meets regularly with the student as the topic is researched, drafted, and submitted at a quality appropriate for publication. A departmental poster session at the end of the semester gives the student the opportunity to disseminate their work to the broader MB&B and Yale community.

MB&B 4910a or b, The Senior Research Essay Christian Schlieker and Nikhil Malvankar
In this class, students complete an independent project by reading primary literature and writing a critical review on a topic chosen by the student in any area of molecular biophysics and biochemistry. The chosen topic must be related to the student's research experiences while enrolled at Yale. For topics that do not draw from a student's research experience, students should enroll in MB&B 490: Senior Literature Essay. The course structure first assists the student to identify a topic and then identifies a member of the MB&B faculty with appropriate expertise. The faculty member, if a member of MB&B, can be the student's research supervisor. The member of faculty meets regularly with the student as the topic is researched, drafted, and submitted at a quality appropriate for publication. A departmental poster session at the end of the semester gives the

student the opportunity to disseminate their work to the broader MB&B and Yale community.

Molecular, Cellular, and Developmental Biology (MCDB)

* **MCDB 0400b, The Science and Politics of Cancer** Robert Bazell
Fundamentals of cell biology, Darwinian evolution, immunology, and genetics that underlie cancer; the history of cancer science and treatment; historical and current policy issues. Prerequisite: AP Biology or equivalent. Enrollment limited to first-year students. SC

* **MCDB 0500a, Immunity and Microbes** Paula Kavathas
In this interdisciplinary course students learn about immunology, microbiology, and pandemics. Fundamentals of the immune system are presented, including how the system recognizes and responds to specific microbes. Microbes that cause illness such as influenza, coronaviruses, HIV, and HPV are discussed as well as how we live in harmony with microbes that compose our microbiome. Readings include novels and historical works on pandemics, polio, AIDS, and smallpox. Enrollment limited to first-year students. SC

MCDB 603a / CBIO 6030a, Seminar in Molecular Cell Biology Min Wu
A graduate-level seminar in modern cell biology. The class is devoted to the reading and critical evaluation of classical and current papers. The topics are coordinated with the CBIO 6602 lecture schedule. Thus, concurrent enrollment in CBIO 6602 is required. Prerequisites: Any undergraduates wishing to enroll must have already taken MCDB 205. In addition, undergraduates are strongly encouraged to reach out to the course directors prior to enrollment.

* **MCDB 0650a, The Science and Politics of HIV/AIDS** Robert Bazell
Study of the basic virology and immunology of HIV/AIDS, along with its extraordinary historical and social effects. Issues include the threat of new epidemics emerging from a changing global environment; the potential harm of conspiracy theories based on false science; and how stigmas associated with poverty, gender inequality, sexual preference, and race facilitate an ongoing epidemic. For all first-year students regardless of whether they are considering a science major. Prerequisite: AP Biology or equivalent. Enrollment limited to first-year students. SC

MCDB 913b and MCDB 9130b / CBIO 9130b / GENE 9130b, Third Laboratory Rotation Andrew Xiao
Third laboratory rotation for Molecular Cell Biology, Genetics, and Development (MCGD) and Plant Molecular Biology (PMB) track students.

* **MCDB 1030b, Cancer** Alexia Belperron
The main purpose of this course is the development of an understanding of the biology of cancer, with emphasis on understanding the core biological principles and how an understanding of these principles is essential to understanding how cancer develops, how it can be treated, and how we can try to prevent its development. Topics include genetics, biochemistry, immunity, infection agents, and challenges for prevention and treatment. Intended for non-science majors and preference is given to first years and sophomores. Prerequisite: High school biology is required. SC

MCDB 1050a or b / MB&B 1050a or b, Biology, the World, and Us Staff
This course is for non-science majors who wish to gain an understanding of modern biology by examining the scientific basis of current issues. We'll consider issues related to: i) pandemics and global infectious disease; ii) the climate crisis; iii) the future of genetics and the new green revolution. Many of the topics have an increasingly large impact on our daily lives. The issues are both social and biological, and it's crucial that social debate be based on a clear understanding of the underlying science. The instructors will explain the scientific foundation beneath each issue. We'll emphasize the nature of science as a process of inquiry rather than a fixed body of terminology and facts. The course is not intended to be a comprehensive survey of biology. SC
o Course cr

* **MCDB 1060a / EEB 1106a / HLTH 1550, Biology of Malaria, Lyme, and Other Vector-Borne Diseases** Alexia Belperron
Introduction to the biology of pathogen transmission from one organism to another by insects; special focus on malaria, dengue, and Lyme disease. Biology of the pathogens including modes of transmission, establishment of infection, and immune responses; the challenges associated with vector control, prevention, development of vaccines, and treatments. Intended for non-science majors; preference to first-years and sophomores. Prerequisite: high school biology. SC

* **MCDB 1090b, Immunity and Contagion** Staff
This interdisciplinary course is for students that want to learn about infectious diseases, pandemics, and the immune system. The immune system evolved to fight pathogens while maintaining homeostasis with our microbiome. The first part of the course is on how the immune system works; this is followed by discussion of different microbes and associated pandemics. This includes flu (1918 pandemic), HIV (AIDS), human papillomavirus (link to cancer), and coronaviruses (COVID-19). Other topics include the human microbiome, cancer immunotherapy and vaccines. Artwork and relevant history are included with a class at the Yale Art Gallery and a class at the medical school.
SC o Course cr

MCDB 2000b, Molecular & Biochemical Principles of Gene Function Anna Marie Pyle and Farren Isaacs
The way we think about our health, our material world, and even our national economy, is undergoing radical change because of the revolution in biology. In this course, students learn the basic concepts that drive this revolution to become active and informed participants. Specifically, this course provides a comprehensive overview of modern molecular biology and its applications. Topics include the structure, function, and chemical behavior of biological macromolecules (DNA, RNA, and protein), chromosome and genome organization, replication and maintenance of the genome, genome editing, transcriptional and translational regulation, structure and function of regulatory noncoding RNAs, RNA splicing, editing and modification and first principles of synthetic biology. Upon completion of the course, students understand the molecular basis for regulated gene expression and the many implications for medicine, biotechnology, and biological engineering. Prerequisites: CHEM 161 or 163, and BIOL 101 (or placement out of BIOL 101 via BIOL 101 placement exam, or via AP5 or IB7HL with permission of core course instructor). SC o Course cr

MCDB 2010Lb, Molecular Biology Laboratory Maria Moreno
Basic molecular biology training in a project-based laboratory setting. Experiments analyze gene function through techniques of PCR, plasmid and cDNA cloning, DNA sequence analysis, and protein expression and purification. Instruction in experimental design, data analysis, and interpretation. Concurrently with or after MCDB 200, or with permission from instructor. For first-years and sophomores interested in research integrated laboratory experience. Special registration procedures apply. Interested students must contact the instructor and attend an organizational meeting during the first week of classes. WR, SC 0 Course cr

MCDB 2020a, Genetics Staff
An introduction to classical, molecular, and population genetics of both prokaryotes and eukaryotes and their central importance in biological sciences. Emphasis on analytical approaches and techniques of genetics used to investigate mechanisms of heredity and variation. Topics include transmission genetics, cytogenetics, DNA structure and function, recombination, gene mutation, selection, and recombinant DNA technology. Prerequisite: BIOL 103 or equivalent performance on the corresponding biological sciences placement examination. SC 0 Course cr

* **MCDB 2030La, Laboratory for Genetics** Staff
Introduction to laboratory techniques used in genetic analysis. Genetic model organisms—bacteria, yeast, *Drosophila,* and *Arabidopsis*—are used to provide practical experience with various classical and molecular genetic techniques including cytogenetics; complementation, epistasis, and genetic suppressors; mutagenesis and mutant analysis, recombination and gene mapping, isolation and manipulation of DNA, and transformation of model organisms. Concurrently with or after MCDB 202. SC 0 Course cr

MCDB 2050b, Cell Biology Staff
A comprehensive introductory course in cell biology. Emphasis on the general principles that explain the molecular mechanisms of cellular function. Prerequisites: BIOL 101 and 102, or equivalent performance on the corresponding biological sciences placement examinations, or a score of 5 on the Advanced Placement test in Biology, or a score of 710 or above on the SAT Biology M test, or MCDB 200. SC 0 Course cr

MCDB 2100b, Developmental Biology Scott Holley, Jacob Musser, and Josien van Wolfswinkel
A survey of the molecular and genetic control of embryonic development, cell-cell communication, and cell differentiation. Emphasis on mechanistic investigation in model organisms that reveal fundamental concepts explaining human birth defects and disease. Topics include gastrulation; neural and mesoderm induction; limb development; heart and vascular development; craniofacial development; adult and embryonic stem cells; regeneration; evolution and development. Introductory biology (BIOL 101, 102, 103) is recommended but not required. Students who have not taken the BIOL series should nonetheless have a good understanding of Mendelian genetics to be prepared for this course. SC

MCDB 2210La, Laboratory for Foundations of Biology Staff
This lab complements the BIOL 101–103 series. An introduction to research and common methodologies in the biological sciences, with emphasis on the utility of model organisms. Techniques and methods commonly used in biochemistry, cell

biology, genetics, and molecular and developmental biology; experimental design; data analysis and display; scientific writing. With permission of instructor or concurrently with or after BIOL 101, 102 or 103. WR, SC 0 Course cr

MCDB 2310La, RNAseq Analysis/Intro to Bioinformatics Josien van Wolfswinkel
This course is about learning to analyze High-throughput sequencing data. This requires insight in what the data represents, as well as the ability to perform basic computational analysis. We approach this by using various scripting languages, to organize and modify the data for further analysis, and use the High Performance Computing Cluster and R to obtain new insights. No prior experience with coding is required, but access to a laptop and an internet connection is essential. Prerequisites: BIOL 101–104, and one 200 level course, or instructor permission. SC

MCDB 2500b, Biology of Reproduction Staff
Introduction to reproductive biology, with emphasis on human reproduction. Development and hormonal regulation of reproductive systems; sexuality, fertilization, and pregnancy; modern diagnosis and treatment of reproductive and developmental disorders; social and ethical issues. BIOL 101, 102, and 103, or equivalent performance on the corresponding biological sciences placement examinations, or a score of 5 on the Advanced Placement test in Biology, or a score of 710 or above on the SAT Biology M test. SC 0 Course cr

MCDB 2900b, Microbiology Stavroula Hatzios and Alex Canto-Pastor
Cell structure of bacteria, bacterial genetics, microbial evolution and diversity, bacterial development, microbial interaction, chemotaxis and motility, gene regulation, microbial genomics and proteomics, CRISPR, metabolism, infectious diseases, mechanisms of pathogenesis, host defense systems, viruses, gut microbiota in health and disease. Prerequisites: BIOL 101, 102, and 103, or equivalent performance on the corresponding biological sciences placement examinations; or one term of biochemistry, or cell biology, or genetics; or with permission of instructor. SC

* **MCDB 2910Lb, Laboratory for Microbiology** Amaleah Hartman
Practical approaches used when working with microbes, primarily bacteria. Topics include microscopy, culture techniques, biochemical/metabolic assays, and basic environmental and medical microbiology. Concurrently with or after MCDB 290. Electronic permission key required; students should contact the instructor prior to the first class meeting. SC ½ Course cr

* **MCDB 3000a or b / MB&B 2000a or b, Biochemistry** Staff
An introduction to the biochemistry of animals, plants, and microorganisms, emphasizing the relations of chemical principles and structure to the evolution and regulation of living systems. Introductory biology coursework (BIOL 101, BIOL 102, BIOL 103) or equivalent performance on the corresponding biological sciences placement examination; one term of organic chemistry (CHEM 174 or CHEM 220); or with permission of instructor. Note for MB&B majors: this course does not substitute for MB&B 300 and MB&B 301. SC 0 Course cr

* **MCDB 3010La or b / MB&B 2510La or b, Laboratory for Biochemistry** Ghazia Abbas
An introduction to current experimental methods in molecular biology, biophysics, and biochemistry. Limited enrollment. Prerequisite: BIOL 101. SC ½ Course cr

* **MCDB 3030Lb, Advanced Molecular Biology Laboratory** Maria Moreno
A laboratory course that provides advanced biology research skills. Weekly workshops focus on laboratory practice, experimental design, data analysis, reading of primary literature, scientific presentations, and scientific writing skills. Application of these skills in project-based laboratory training sponsored by a faculty member. Enrollment limited. Special registration procedures apply; interested students must contact the instructor and attend an organizational meeting. This class is recommended to students in the sciences who are in their junior year and will be completing a senior research project requirement for graduation. SC RP

* **MCDB 3100a / BENG 3200a, Physiological Systems** Staff
Regulation and control in biological systems, emphasizing human physiology and principles of feedback. Biomechanical properties of tissues emphasizing the structural basis of physiological control. Conversion of chemical energy into work in light of metabolic control and temperature regulation. Prerequisites: CHEM 165 or 167 (or CHEM 113 or 115), or PHYS 180 and 181; MCDB 120, or BIOL 101 and 102. SC
0 Course cr

MCDB 3150b, Pathobiology Jon Morrow, Samuel Katz, Karin Finberg, Harold Sanchez, and Declan McGuone
Mechanisms of human disease from a pathologic perspective. Topics include general cell injury and the biology of cellular senescence, cancer genetics, renal disease, neurologic disease, Gastrointestinal and lung disease, along with the systemic manifestations of disease with clinical correlations. Opportunities to observe under the tutelage of an attending pathologist the manifestations of disease in autopsies at Yale-New Haven Hospital and the role of molecular-based diagnostics in medical decision making will be available. Enrollment limited; preference to junior and senior majors in MCDB or MB&B. Prerequisites: MCDB 205, 300, or 310 SC RP

MCDB 3200a / NSCI 3200a, Neurobiology Haig Keshishian and Harry McNamara
The excitability of the nerve cell membrane as a starting point for the study of molecular, cellular, and systems-level mechanisms underlying the generation and control of behavior. At least 1 semester of college chemistry is strongly recommended. SC 0 Course cr

MCDB 3210La / NSCI 3210La, Laboratory for Neurobiology Haig Keshishian
Introduction to the neurosciences. Projects include the study of neuronal excitability, sensory transduction, CNS function, synaptic physiology, and neuroanatomy. Concurrently with or after MCDB 320. SC ½ Course cr

MCDB 3250a, Molecular Hallmarks of Cancer Staff
This course provides a comprehensive introduction to the fundamentals of cancer biology and cancer treatment. Topics covered include: cancer genetics, genomics and epigenetics; familial cancer syndromes; signal transduction, cell cycle control, and apoptosis; cancer metabolism; stem cells and cancer; metastasis; cancer immunology and immunotherapy; conventional and molecularly-targeted therapies; and early detection and prevention. Prerequisites: Introductory cources (BIOL101–104) and two MCDB200-level courses (selected from MCDB200, MCDB202, MCDB205, and MCDB210) or instructor permission. 0 Course cr

MCDB 3290a / NSCI 3290a, Sensory Neuroscience Through Illusions Damon Clark and Michael O'Donnell

Animals use sensory systems to obtain and process information about the environment around them. Sensory illusions occur when our sensory systems provide us with surprising or unexpected percepts of the world. The goal of this course is to introduce students to sensory neuroscience at the levels of sensor physiology and of the neural circuits that process information from sensors. The course is centered around sensory illusions, which are special cases of sensory processing that can be especially illustrative, as well as delightful. These special cases are used to learn about the general principles that organize sensation across modalities and species. Prerequisites: BIOL 101–104; NSCI 160 or NSCI 320 or permission of instructor. SC

MCDB 3310a / BENG 3230a / MB&B 3300a and MB&B 3310a / MB&B 3310a / NSCI 3240a, Modeling Biological Systems I Thierry Emonet and Kathryn Miller-Jensen

Biological systems make sophisticated decisions at many levels. This course explores the molecular and computational underpinnings of how these decisions are made, with a focus on modeling static and dynamic processes in example biological systems. This course is aimed at biology students and teaches the analytic and computational methods needed to model genetic networks and protein signaling pathways. Students present and discuss original papers in class. They learn to model using MatLab in a series of in-class hackathons that illustrate the biological examples discussed in the lectures. Biological systems and processes that are modeled include: (i) gene expression, including the kinetics of RNA and protein synthesis and degradation; (ii) activators and repressors; (iii) the lysogeny/lysis switch of lambda phage; (iv) network motifs and how they shape response dynamics; (v) cell signaling, MAP kinase networks and cell fate decisions; and (vi) noise in gene expression. Prerequisites: MATH 115 or 116. BIOL 101–104, or with permission of instructors. This course also benefits students who have taken more advanced biology courses (e.g. MCDB 200, MCDB 310, MB&B 300/301). QR, SC 0 Course cr

* **MCDB 3420La, Laboratory in Nucleic Acids I** Douglas Kankel

A project from a research laboratory within the MCDB department, using technologies from molecular and cell biology. Laboratory meets once a week during the term. Concurrently with or after MCDB 202, 205, or 300. Enrollment limited. Special registration procedures apply; students should contact the instructor during January of the year you intend to take the course. SC 0 Course cr

* **MCDB 3430La, Laboratory in Nucleic Acids II** Douglas Kankel

Continuation of MCDB 342L to more advanced projects in molecular and cell biology, such as microarray screening and analysis, next-generation DNA sequencing, or CRISPR/Cas editing of genes. Laboratories meet twice a week for the second half of the term. 0.5 Yale College course credit(s) Enrollment limited. Special registration procedures apply; students should contact the instructor during January of the year you intend to take the course. Prerequisite; MCDB 342L or permission of instructor. SC 0 Course cr

* **MCDB 3440Lb, Experimental Techniques in Cellular Biology** Joseph Wolenski

An inquiry-based approach to research in cell and molecular biology, with emphasis on experimental techniques commonly used in modern biomedical laboratories. Research is module-based and covers pertinent and timely topics. Methods include SDS-

PAGE, immunoblotting, immunoprecipitation of proteins, column chromatography, mammalian cell culture, cell fractionation, cell transfection, DNA purification, PCR, and phase contrast and confocal microscopy. Meets during January and February. Prerequisite: MCDB 205. Special registration procedures apply; interested students must contact the instructor at least eighteen months in advance. SC ½ Course cr

* **MCDB 3450Lb, Experimental Strategies in Cellular Biology** Joseph Wolenski
Continuation of MCDB 344L, with increased emphasis on experimental design, independent research, presentation of data and research seminars. Students develop semi-independent research projects in modern biomedical research. Emphasis on key components of being a successful principal investigator, including benchwork, seminar presentations, lab meetings, and critical analysis of data. Prepares for MCDB 475, 485, or 495. Meets during March and April. Prerequisite: MCDB 344L. Special registration procedures apply; interested students should contact the instructor. SC ½ Course cr

* **MCDB 3500a, Epigenetics** Nadya Dimitrova, Josien van Wolfswinkel, and Yannick Jacob
Study of epigenetic states and the various mechanisms of epigenetic regulation, including histone modification, DNA methylation, nuclear organization, and regulation by non-coding RNAs. Detailed critique of papers from primary literature and discussion of novel technologies, with specific attention to the impact of epigenetics on human health. Introductory courses (BIOL 101–104) and two MCDB 200-level courses (strongly recommended: MCDB 202 and MCDB 200 or MCDB 210) or instructor permission. SC 0 Course cr

* **MCDB 3550a, The Cytoskeleton, Associated Proteins, and Disease** Surjit Chandhoke
In-depth discussion of the cytoskeleton, proteins associated with the cytoskeleton, and diseases that implicate members of these protein families. Preference given to seniors in the MCDB major. Prerequisites: BIOL 101–104 *and* at least one MCDB 200-level course. SC

* **MCDB 3640a / MB&B 3640a, Light Microscopy: Techniques and Image Analysis** Joseph Wolenski and Jonathon Howard
A rigorous study of principles and pertinent modalities involved in modern light microscopy. The overall course learning objective is to develop competencies involving advanced light microscopy applications common to multidisciplinary research. Laboratory modules coupled with critical analysis of pertinent research papers cover all major light microscope methods—from the basics (principles of optics, image contrast, detector types, fluorescence, 1P and 2P excitation, widefield, confocal principle, TIRF), to more recent advances, including: superresolution, lightsheet, FLIM/FRET, motion analysis and force measurements. This course is capped at 8 students to promote interactions and ensure a favorable hands-on experience. Priority for enrollment is given to students who are planning on using these techniques in their independent research. Prerequisites: MCDB 205, PHYS 170/171 or above, either CHEM 161/165 or above; with CHEM 134L, 136L or permission from the instructor. SC

* **MCDB 3700b, Biotechnology** Craig Crews, Joseph Wolenski, and F Kenneth Nelson
The principles and applications of cellular, molecular, and chemical techniques that advance biotechnology. The most recent tools and strategies used by industrial labs, academic research, and government agencies to adapt biological and chemical

compounds as medical treatments, as industrial agents, or for the further study of biological systems. Prerequisite: MCDB 200, 202, or 300. SC 0 Course cr

* **MCDB 3750b, Human Biology: Research Methods, Questions, and Societal impact** Haig Keshishian

This course is intended for upper level MCDB majors and addresses human biology and human subjects research methods and its impact on our understanding of identity. The first third of the course evaluates human subjects research methods and the impact of genetics research on the concept of identity. In the second section of the course, we examine the biology and research that influences identity stereotypes. The last third of the term we examine the biology and research methods to study past and current issues in society related to human health and biology. Prerequisites: BIOL 101–104, and two MCDB 200-level courses or with permission of instructor. SC

* **MCDB 3800a, Advances in Plant Molecular Biology** Yannick Jacob, Josh Gendron, Vivian Irish, and Alex Canto-Pastor

The study of basic processes in plant growth and development to provide a foundation for addressing critical agricultural needs in response to a changing climate. Topics include the latest breakthroughs in plant sciences with emphasis on molecular, cellular, and developmental biology; biotic and abiotic plant interactions; development, genomics, proteomics, epigenetics and chemical biology in the context of plant biology; and the current societal debates about agrobiotechnology. Prerequisites: BIOL 101–104 and two MCDB 200-level courses, or permission of instructor. SC

* **MCDB 4150b, Cellular and Molecular Physiology** Emile Boulpaep

Study of the processes that transfer molecules across membranes. Classes of molecular machines that mediate membrane transport. Emphasis on interactions among transport proteins in determining the physiologic behaviors of cells and tissues. Intended for seniors majoring in the biological sciences. Recommended preparation: MCDB 205, 310, 320, or permission of instructor. SC

* **MCDB 4250a / MB&B 4250a, Basic Concepts of Genetic Analysis** Jun Lu

The universal principles of genetic analysis in eukaryotes. Reading and analysis of primary papers that illustrate the best of genetic analysis in the study of various biological issues. Focus on the concepts and logic underlying modern genetic analysis. Prerequisite: MCDB 202 or pre-approval of instructor. SC

* **MCDB 4300a, Biology of the Immune System** Staff

The development of the immune system. Cellular and molecular mechanisms of immune recognition. Effector responses against pathogens. Immunologic memory and vaccines. Human diseases including allergy, autoimmunity, immunodeficiency, and HIV/AIDS. After MCDB 300. SC 0 Course cr

* **MCDB 4350b, Landmark Papers in Cell Biology** Mark Mooseker

This seminar involves discussion and critical evaluation of selected research papers (1-2/week) that were important in determining the directions of modern cell biological research. Emphasis is on the nature of the problem, evaluation of the experimental approaches and results, and the authors' interpretation of the results. The format is round table discussion of the paper, method by method, figure by figure. All are expected to be actively engaged in these discussions which require a thorough reading of the papers as well as further background reading particularly with respect to key methods used in the paper (e.g. how is EM autoradiography performed).

Prerequisites: Foundations in Biology 101–104, although MCDB 205 (Cell Biology) would be highly beneficial. For background purposes, several copies of various cell biology texts will be placed on closed reserve at Bass. Permission of instructor required. Enrollment preference is given to seniors. SC

* **MCDB 4500b, The Human Genome** Stephen Dellaporta
A focus on the primary scientific literature covering the principles of genomics and its application to the investigation of complex human traits and diseases. Topics include the technology of genome sequencing and resequencing, the characterization of sequence and structural variation in human populations, haplotype and linkage disequilibrium analysis, genome-wide association studies, the comparative genomics of humans and our closest relatives, and personalized genomics and medicine. Enrollment limited to 15. Students should contact the instructor prior to the first week of classes. Prerequisite: MCDB 202; a course in statistics is strongly recommended. SC

* **MCDB 4700a or b, Tutorial in Molecular, Cellular, and Developmental Biology** Staff
Individual or small-group study for qualified students who wish to investigate a broad area of experimental biology not presently covered by regular courses. A student must be sponsored by a Yale faculty member, who sets the requirements. The course must include one or more written examinations and/or a term paper. Intended to be a supplementary course and, therefore, to have weekly or biweekly discussion meetings between the student and the sponsoring faculty member. To register, the student must prepare a form available in Canvas as well as on the MCDB Undergraduate Forms site, and a written plan of study with bibliography, approved by the faculty research adviser. The form and proposal must be uploaded to Canvas by the end of add/drop period. The final paper is due in the hands of the sponsoring faculty member, with a copy to the course instructor, by the last day of classes. In special cases, with approval of the Director of Undergraduate Studies, this course may be elected for more than one term, but only one term may count as an elective toward the major. Fulfills the senior requirement for the B.A. degree in MCDB if taken in the senior year.

* **MCDB 4740a or b, Independent Research** Joseph Wolenski
Research project under faculty supervision taken Pass/Fail. This is the only independent research course available to underclassmen. Students are expected to spend approximately ten hours per week in the laboratory. To register, the student must submit a form, which is available from the course site on Canvas@Yale, and a written plan of study with bibliography, approved by the faculty research adviser. The form and proposal must be uploaded to Canvas@Yale by the end of the second week of classes. A final research report is required at the end of the term. Students who take this course more than once must reapply each term. Guidelines for the course should be obtained from the office of the director of undergraduate studies or downloaded from the Canvas@Yale server.

* **MCDB 4750a or b, Senior Independent Research** Joseph Wolenski
Research project under faculty supervision, ordinarily taken to fulfill the senior requirement. This course is only available to MCDB seniors and they are awarded a letter grade. Students are expected to spend approximately ten hours per week in the laboratory. To register, the student must prepare a form, which is available from the course site on Canvas@Yale, and a written plan of study with bibliography, approved by the faculty research adviser. The form and proposal must be uploaded to

Canvas@Yale by the end of the second week of classes. The final research paper is due in the hands of the sponsoring faculty member, with a copy uploaded to Canvas@Yale, by the last day of classes. Students who take this course more than once must reapply each term; students planning to conduct two terms of research should consider enrolling in MCDB 485, 486. Students should line up a research laboratory during the term preceding the research. Fulfills the senior requirement for the B.A. degree if taken in the senior year. Two consecutive terms of this course fulfill the senior requirement for the B.S. degree if at least one term is taken in the senior year.

* **MCDB 482oa, Advanced Seminar in Cell Biology: Intracellular Signal Transduction**
Craig Crews
Discussion of intracellular signal transduction pathways. Detailed critique of experimental approaches, controls, results, and conclusions of selected current and classic papers in this field. SC

* **MCDB 485oa and MCDB 486ob, Senior Research** Joseph Wolenski
Individual two-term laboratory research projects under the supervision of a faculty member. For MCDB seniors only. Students are expected to spend ten to twelve hours per week in the laboratory, and to make presentations to students and advisers. Written assignments include a short research proposal summary due at the beginning of the first term, a grant proposal due at the end of the first term, and a research report summarizing experimental results due at the end of the second term. Students are also required to present their research in either the fall or the spring term. A poster session is held at the end of the spring term. Students should line up a research laboratory during the term preceding the research. Guidelines for the course may be obtained on the course site on Canvas@Yale. Written proposals are due by the end of the second week of classes. Fulfills the senior requirement for the B.S. degree if taken in the senior year.

* **MCDB 495oa and MCDB 496oa or b, Senior Research Intensive** Joseph Wolenski
Individual two-term directed research projects in the field of biology under the supervision of a faculty member. For MCDB seniors only. Before registering, the student must be accepted by a Yale faculty member with a research program in experimental biology and obtain the approval of the instructor in charge of the course. Students spend approximately twenty hours per week in the laboratory, and make written and oral presentations of their research to students and advisers. Written assignments include a short research proposal summary due at the beginning of the first term, a grant proposal due at the end of the first term, and a research report summarizing experimental results due at the end of the second term. Students must attend a minimum of three research seminar sessions (including their own) per term. Students are also required to present their research during both the fall and spring terms. A poster session is held at the end of the spring term. Guidelines for the course may be obtained from the course site on Canvas@Yale. Written proposals are due by the end of the second week of classes. Fulfills the senior requirement for the B.S. degree with an intensive major. 2 Course cr per term

Music (MUSI)

* **MUSI 0035b / CPSC 0350b, Twenty-First Century Electronic and Computer Music Techniques** Scott Petersen

Exploration of twenty-first century electronic and computer music through the diverse subjects and issues at the intersection of technology and new music. How computers have changed and challenged the analysis, composition, production, and appreciation of music over the last fifty years. Knowledge of basic music theory and the ability to read Western musical notation is assumed. Enrollment limited to first-year students. QR

* **MUSI 0081a / ER&M 0581a / SOCY 0074a, Race and Place in British New Wave, K-Pop, and Beyond** Grace Kao

This seminar introduces you to several popular musical genres and explores how they are tied to racial, regional, and national identities. We examine how music is exported via migrants, return migrants, industry professionals, and the nation-state (in the case of Korean Popular Music, or K-Pop). Readings and discussions focus primarily on the British New Wave (from about 1979 to 1985) and K-Pop (1992–present), but we also discuss first-wave reggae, ska, rocksteady from the 1960s–70s, British and American punk rock music (1970s–1980s), the precursors of modern K-Pop, and have a brief discussion of Japanese City Pop. The class focuses mainly on the British New Wave and K-Pop because these two genres of popular music have strong ties to particular geographic areas, but they became or have become extremely popular in other parts of the world. We also investigate the importance of music videos in the development of these genres. Enrollment limited to first year students. SO

MUSI 1111a, Elements of Musical Pitch and Time Staff

The fundamentals of musical language (notation, rhythm, scales, keys, melodies, and chords), including writing, analysis, singing, and dictation. Intended for students who have no music reading ability. 0 Course cr

* **MUSI 1125a, Writing (About) Music: Memory in and as Music** Alexandra Dreher

How does the music of Beyoncé, Bob Dylan, and Billie Eilish perform memory and remembering? In what ways does music concretize, express, or externalize memory? Does music allow us to revisit a past? How might music manipulate memory? As we explore such questions about the connection between music and memory, we consider how our relationships to ourselves, communities, and societies can be shaped through remembering music. We explore this through musical case studies, memory studies, and musical technologies of remembering. This exploration involves an interdisciplinary approach, with studies of music at its center. No ability to read Western music notation is assumed or required. WR, HU

* **MUSI 1137a / HUMS 1390a, Western Philosophy in Four Operas 1600–1900** Gary Tomlinson

This course intensively studies four operas central to the western repertory, spanning the years from the early 17th to the late 19th century: Monteverdi's *Orfeo*, Mozart's *Don Giovanni*, Wagner's *Die Walküre* (from *The Ring of the Nibelungs*), and Verdi's *Simon Boccanegra*. The course explores the expression in these works of philosophical stances of their times on the human subject and human society, bringing to bear writings contemporary to them as well as from more recent times. Readings include works of Ficino, Descartes, Rousseau, Wollstonecraft, Schopenhauer, Kierkegaard, Douglass, Marx, Nietzsche, Freud, and Adorno. We discover that the expression of changing

philosophical stances can be found not only in dramatic themes and the words sung, but in the changing natures of the musical styles deployed. HU

* **MUSI 1185a / TDPS 2502a, American Musical Theater History** Dan Egan
Critical examination of relevance and context in the history of the American musical theater. Historical survey, including nonmusical trends, combined with text and musical analysis. Limited enrollment. Interested students should contact dan.egan@yale.edu for application requirements. WR, HU

* **MUSI 2100a, Score Reading and Analysis** Staff
This beginner's class in Score Reading and Analysis builds the basic skills in the following—the ability to read a score both at the keyboard and through silent reading comprehending—clefs, transposition, orchestration, form, the instruments of the period, and discussing playing style of the period in question. During the semester the class builds a greater understanding of the characters (orchestral instruments) in the score, the historical context, formal analysis (sonata form, rondo, etc) and the keyboard skills to realize, understand, comprehend, and appreciate the works being studied and being able to play a minimum of 3 lines from the score. Some Keyboard skills. Ability to read the Treble and Bass clefs and, preferably, a skill on at least one orchestral instrument.

* **MUSI 2121a, Modal Counterpoint: Analysis and Composition** Staff
Studies in the theory, analysis, and composition of sixteenth-century modal polyphony. Knowledge of basic staff notation, intervals, and triads. 0 Course cr

* **MUSI 2220a, The Performance of Chamber Music** Wendy Sharp
Coached chamber music emphasizing the development of ensemble skills, familiarization with the repertory, and musical analysis through performance. Admission by audition only. May be repeated for credit. For audition information e-mail wendy.sharp@yale.edu. Credit for MUSI 220 only on completion of MUSI 221. ½ Course cr

* **MUSI 2228a / TDPS 2500a, Musical Theater Performance I** Annette Jolles and Dan Egan
The structure, meaning, and performance of traditional and contemporary musical theater repertoire. Focus on ways to "read" a work, decipher compositional cues for character and action, facilitate internalization of material, and elicit lucid interpretations. This semester's course also embraces the online format to address performing and recording virtually as a vital tool in the current field of musical theater. The course combines weekly synchronous learning and private coaching sessions. For singers, music directors, and directors. Admission by audition and application only. For registration requirements and audition information contact dan.egan@yale.edu. May be repeated for credit. HU RP

* **MUSI 2230a, Composing for Musical Theater** Joshua Rosenblum and Dan Egan
This course is open to all students (including graduate programs) and from any major, although priority is given to music majors. Knowledge of the basics of music theory and music notation is required, and some familiarity with the musical theater idiom is expected. Some prior composing experience is recommended. Piano skills are very helpful, but not required. Normally the class size is limited, so that all assignments can be performed and fully considered during the class meeting time. Prerequisite:

Enrollment limited to 12. Please contact joshua.rosenblum@yale.edu with any questions about eligibility. HU RP

* **MUSI 2232a, Central Javanese Gamelan Ensemble** Phil Acimovic
An introduction to performing the orchestral music of central Java and to the theoretical and aesthetic discourses of the gamelan tradition. Students form the nucleus of a gamelan ensemble that consists primarily of tuned gongs and metallophones; interested students may arrange for additional private instruction on more challenging instruments. The course culminates in a public performance by the ensemble. This course may be repeated for credit. No previous musical experience required. RP

* **MUSI 2238a, Contemporary Chamber Music Performance** Maiani da Silva
This performance course offers an immersive experience in contemporary chamber music, where instrumentalist students collaborate closely with composition students (of MUSI 4220) in a dynamic, workshop-driven environment. Emphasizing a collaborative approach, the course focuses on the intersection of performance and composition, offering a space where students engage in the creative process through hands-on interaction with newly composed works. Students will explore the unique challenges and rewards of bringing contemporary compositions to life, learning to interpret and communicate the composer's vision while also contributing their artistic insights to the ongoing evolution of each piece. Throughout the course, students will gain invaluable experience in *collaborative and idiomatic problem-solving*, *creative flexibility and leadership*, and *interdisciplinary communication;* key skills that are essential for success in today's evolving musical landscape. Instrumentalists will deepen their understanding of their roles in bringing to life a new piece, learning not only how to execute a new composition but also how to actively shape the piece's final form through dialogue and experimentation with the composer, culminating in a performance of multiple new works. Admission by audition only. Students must bring their instruments to class. ½ Course cr

* **MUSI 2240a, The Performance of Early Music** Grant Herreid
A study of musical styles of the twelfth through early eighteenth centuries, including examination of manuscripts, musicological research, transcription, score preparation, and performance. Students in this class form the nucleus of the Yale Collegium Musicum and participate in a concert series at the Beinecke Library. Admission by audition only. May be repeated for credit. For audition information e-mail grant.herreid@yale.edu. HU RP

MUSI 3104a, Tuning and Temperament Daniel Walden
This course combines scientific, practical, and historical methods in examining theories of tuning and temperament from the past two millennia. We consult primary and secondary sources in our investigations ranging from Sanskrit tunings to Bach's temperaments to 19th-c. Mexican microtonalism to hyperpop. We build and take apart instruments in the classroom, cultivate the skills to tune keyboards in a variety of ways, learn how to operate auto-tune software and applications for advanced acoustical analysis, and construct our musical temperaments. The overall goal is to recognize how the seemingly abstract principles of tuning and temperament have affected the course not just of music history, but of science, technology, and society. Ability to read notation and an understanding of basic diatonic harmony are required. HU

* **MUSI 3115a, Fundamentals of Music Technology** Konrad Kaczmarek
Fundamental principles of music technology including sound recording and reproduction, digital audio, digital signal processing, audio synthesis techniques, musical acoustics, and psychoacoustics. Emphasis on the theory of music technology through investigations into the tools used to analyze, perform, and create electroacoustic and computer-generated music. QR, SC RP

* **MUSI 3220a, Composition I: Genre, Style and Techniques** Kathryn Alexander
Intermediate creative projects in music composition, instrumentation, and scoring for visual media. Study of compositional techniques throughout genres and styles. Students may compose songs in any genre, write in jazz idioms, compose a classical string quartet, produce an EDM tune, score to animation or video; or other projects individually designed. Group critique as an in-class activity and collaborative workshops with performers in Music 2238. Questions? Contact the instructor at kathryn.alexander@yale.edu. Prerequisite: 200-level music theory course or equivalent experience. HU RP

* **MUSI 3228a, Introduction to Conducting** Staff
An introduction to conducting through a detailed study of the problems of baton technique. Skills applied to selected excerpts from the standard literature, including concertos, recitatives, and contemporary music.

* **MUSI 3242a, Inhabiting Text and Music in Contemporary Song Repertoire**
AZ (A. Zayaruznaya)
Intended for singers and pianists who have had some solo performance experience, this course is focused on developing an understanding of how our desire to convey truth, our need to engage and collaborate, and the honing of our respective musical skills feeds our imaginations, thereby enhancing our ability to communicate "meaning" through music. With focus on specific late 20th- to early 21st-century compositions, we discuss biographical information of the poets and composers, historical context, the composers' musical responses to the poems and our own unique engagement with the text and the music. Each student is assigned specific songs to present in class, culminating each half-semester in a performance on campus. Music reading proficiency and previous experience solo performing, as either singer or pianist is required. Submission of a video of the student singing (with or without piano accompaniment) and/or playing piano is required.

* **MUSI 3245a, Lessons** Kyung Yu
Individual instruction in the study and interpretation of musical literature. No more than four credits of lessons can be applied towards the 36-credit degree requirement. Auditions for assignment to instructors (for both credit and noncredit lessons) are required for first year and some returning students, and are held only at the beginning of the fall term. For details, see the Music department's program description in the YCPS.

MUSI 3353a, Western Art Music: 1968–Present Trevor Baca
A survey of musical practices, institutions, genres, styles, and composers in Europe, the Americas and Asia from 1968 to the present. This class prioritizes the identification of pieces, composers and stylistic practice through a study of scores and recordings. HU

* **MUSI 4107a, Commercial and Popular Music Theory II** Nathaniel Adam
This course is a continuation of MUSI 207 Commercial and Popular Music Theory I. While 207 covered fundamentals of analysis, 407 involves further research and more complex analysis, with more presentations and transcription projects in addition to a final paper. Beyond harmonic and formal analysis, 407 explores intersectional topics such as history, video, politics, race, gender, and sexuality in the context of popular music. Completion of MUSI 2107 (seniors and graduate students may request instructor's permission without taking 2107). HU RP

* **MUSI 4203a, The Media of Sound: Experimental Approaches to Sound Recording and Media Design** Ross Wightman
This course explores the multifaceted and multimedia approaches used in the industry of recording sound and designing the art objects that contain them. With a focus on experimental and conceptual applications of this technology, students engage in creating sonic/visual works that subvert, alter or synthesize the various media forms that go into 'music production.' Alongside creative projects, historical and contemporary works of sound art and music production are examined as case studies to exemplify both the norms of the industry and works that subvert them. Concepts related to the transmission and reception of sound through various media (tape, vinyl, MP3 etc.) are explored alongside the quirks, limitations and advantages of the milieu of hardware and software options (multi-track recording devices, DAWs etc.) both contemporary and antiquated that have been available to producers and artists alike over the last century and beyond. Topics include formatting artwork for sound recordings, recording and editing sound, collaboration on production of both digital and physical media, and more. This course is not available to students previously enrolled in CSGH 370. RP

* **MUSI 4220a, Composition Seminar III** Konrad Kaczmarek
Advanced analytic and creative projects in music composition and instrumentation, with a focus on writing for chamber ensembles. Ongoing study of evolving contemporary procedures and compositional techniques. Group and individual lessons to supplement in-class lectures. Admission by audition only. May be repeated for credit. Enrollment limited to 10. To audition, students should upload two PDF scores and MP3 recordings in a single zip file by 4 p.m. on the second Wednesday of the semester, to the designated Music 4220 audition assignment page at the Canvas site. Students with questions should contact the instructor at konrad.kaczmarek@yale.edu. Prerequisites: Both MUSI 3220 and 3221. RP

MUSI 4227b / CPSC 4320b, Computer Music: Sound Representation and Synthesis Scott Petersen
Study of the theoretical and practical fundamentals of computer-generated music, with a focus on low-level sound representation, acoustics and sound synthesis, scales and tuning systems, and programming languages for computer music generation. Theoretical concepts are supplemented with pragmatic issues expressed in a high-level programming language. Ability to read music is assumed. After CPSC 202 and 223. QR

MUSI 4228a / CPSC 4310a, Computer Music: Algorithmic and Heuristic Composition Scott Petersen
Study of the theoretical and practical fundamentals of computer-generated music, with a focus on high-level representations of music, algorithmic and heuristic composition,

and programming languages for computer music generation. Theoretical concepts are supplemented with pragmatic issues expressed in a high-level programming language. Ability to read music is assumed. After CPSC 202 and 223. QR

*** MUSI 4231a / TDPS 4028a, The Spirit of the Original: Adaptation Lab** Dan Egan
An advanced course in musical theater/opera/film adaptation from multiple genres. Exploration of source material and collaboration in scores by Jeanine Tesori and others, mining each for inherent structure, nuance, utility, and applicability for emerging writers. Importance of honoring the original source even when the adaptation goes far afield. Study examples will be chosen from adaptations of short stories, plays, musicals, film, Shakespeare, and art. What is salient in process and execution. Possible guest artists include all Tesori collaborators. Final project will be presentation of a work in progress, pitched at midterm. Assumption of advanced writing practice, with at least one completed show—score, lyrics, or libretto. Applicants will submit a one-page statement outlining readiness for the course, experience, and goals for enrollment. HU

*** MUSI 4245a, Advanced Lessons** Kyung Yu
Individual instruction for advanced performers in the study and interpretation of musical literature. No more than four credits of lessons can be applied towards the 36-credit degree requirement. Auditions for assignment to instructors (for both credit and noncredit lessons) are required for first year and some returning students, and are held only at the beginning of the fall term. For details, see the Music department's program description in the YCPS.

*** MUSI 4249a, Jazz Improvisation** Wayne Escoffery
In this course students study basic, intermediate, and advanced concepts of improvisation and learn the essentials for the *Jazz Language* through solo transcription and analysis. Students learn how to use vocabulary (or musical phrases) and a variety of improvisational devices and techniques over common chords and chord progressions. Upon completion of the course students have a deeper understanding of what it takes to become a great improviser, what to practice and how to practice it, and how to go about expanding their *Jazz Vocabulary* in order to naturally develop a unique improvisational voice. Students are required to bring their instruments to class. Prerequisite: Basic understanding of Jazz nomenclature and some experience improvising is advised. Admission by audition only. Permission of the instructor is required. ½ Course cr

*** MUSI 4300a / ITAL 3460a, The Castrato** Jessica Peritz
This seminar locates the intriguing, anxiety-inducing figure of the castrato at the nexus of fact and fiction, working to disentangle the historical realities of castrato lives from fantasies (both popular and scholarly) about castrato bodies, voices, and sexualities. Though the practice of castration has a long and complicated global history, the Italian term *castrato* denotes a particular group of people within that history: the many thousands of Italian boys, mostly from poor families, who were subjected to surgery between 1550 and 1850 with the express purpose of altering their voices for music-making. As the most celebrated performers of vocal music in early modern Europe, castrati were adored, worshipped, and heaped with wealth—but also mocked, shunned, and denied basic human rights. These and other contradictions characterize the castrato's fraught place within music history, while also resonating across time with

twenty-first-century concerns about constructions of gender, sexuality, race, class, and (dis)ability. HU

* **MUSI 4362a / CPLT 1950a / ENGL 3505a / HUMS 2000a, Medieval Songlines** Ardis Butterfield
Introduction to medieval song in England via modern poetic theory, material culture, affect theory, and sound studies. Song is studied through foregrounding music as well as words, words as well as music. WR, HU

* **MUSI 4371a, Techniques of Musical Theater Score Interpretation** Dan Egan
Techniques of Musical Theater Score Interpretation offers historical perspectives on musical theater scoring, music direction, and conducting together with present-day applications addressing the unique needs of musicians tasked with coaching, sight-reading/transposition, conducting, orchestral reductions, and arranging for musical theater. Exploration of changing cultural, economic, and musical taste across eras and the implications of the changes for musicians working in the musical theater. Permission of instructor via audition/interview. Music reading ability. Basic knowledge of musical theater literature. Dependable keyboard fluency. HU RP

* **MUSI 4470a / FILM 4270a / HUMS 2631a, Noise** Brian Kane
A study of noise from musical, philosophical, and cultural perspectives. Reading and discussion of theoretical, political, ecological, and avant-garde writings on noise; critical study of musical repertoire involving noise, sound art, and recorded sound; introduction to current debates in sound studies and auditory culture; hands-on work with electronic noise. WR, HU

* **MUSI 4478a / FILM 4200a, Radio** Brian Kane
Introduction to selected topics in the social history, technique, and meaning of radio in America, with a focus on music and mediation. Topics may include: the nature of the "radio archive;" early radio listening (DXing); the formation of the networks; advertising; the rise of audience research; African-American radio; the origins of the DJ and format radio. Workload may include: short papers, book reviews, radio building, archival research, and end-of- semester project. HU

* **MUSI 4480a / AFAM 4779a, Music of the Caribbean: Cuba and Jamaica** Michael Veal
An examination of the Afro-diasporic music cultures of Cuba and Jamaica, placing the historical succession of musical genres and traditions into social, cultural, and political contexts. Cuban genres studied include religious/folkloric traditions (Lucumi/Santeria and Abakua), rumba, son, mambo, pachanga/charanga, salsa, timba and reggaeton. Jamaican genres studied include: folkloric traditions (etu/tambu/kumina), Jamaican R&B, ska, rock steady, reggae, ragga/dancehall. Prominent themes include: slavery, Afro-diasporic cultural traditions, Black Atlantic culture, nationalism/independence/post-colonial culture, relationships with the United States, music & gender/sexuality, technology. HU

* **MUSI 4995a, Individual Study** AZ (A. Zayaruznaya)
Original essay in ethnomusicology, music history, music theory, or music technology and/or multimedia art under the direction of a faculty adviser. Admission to the course upon submission to the department of the essay proposal by the registration deadline, and approval of the director of undergraduate studies.

* **MUSI 4996a, The Senior Recital** AZ (A. Zayaruznaya)
Preparation and performance of a senior recital and accompanying essay under faculty supervision. Admission by permission of the director of undergraduate studies. Prerequisite: MUSI 461.

* **MUSI 4997a, The Senior Project in Composition** AZ (A. Zayaruznaya)
Preparation of a senior composition project under faculty supervision. Admission by permission of the composition faculty of the Department of Music. Prerequisites: MUSI 320, 321, 420, and 421.

* **MUSI 4998a, The Senior Project in Musical Theater Composition** AZ (A. Zayaruznaya)
Preparation of a senior composition project in the field of musical theater under faculty supervision. Admission by permission of the coordinator of the Shen Curriculum. Two terms of MUSI 314 or equivalent.

* **MUSI 4999a, The Senior Essay** AZ (A. Zayaruznaya)
Preparation of a senior essay under faculty supervision. Admission by permission of the director of undergraduate studies.

Naval Science (NAVY)

NAVY 1000a, Naval Science Laboratory Staff
Leadership and practical application skills from the Professional Core Competency objectives that are not covered in other Naval Science courses. Emphasis on professional training that is not of an academic nature. Includes both classroom instruction and physical training. Topics and special briefings as determined by Naval Science faculty and the Naval Service Training Command. Required for NROTC students each term. Receives no credit; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors. o Course cr

* **NAVY 1110a, Introduction to Naval Science** Sean Cooper
An overview of the naval service for first-year Naval ROTC students and others interested in pursuing the NROTC program. Organization, missions, customs and traditions, leadership principles, ethics, duties of a junior officer, and career options in the U.S. Navy and Marine Corps. Discussion of shipboard organization and procedures, safety, and damage control prepares students for summer training aboard naval vessels. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

* **NAVY 2110a, Seapower and Maritime Affairs** William Johnson
This course is a study of the U.S. Navy and the influence of U.S. sea power on world history that incorporates both a historical and political science process to explore the major events, attitudes, personalities, and circumstances that have imbued the U.S. Navy with its proud history and rich tradition. This course introduces grand strategy, evaluating key components, and examples from ancient history and modern U.S. history. It deals with issues of national imperatives in peacetime, as well as war, varying maritime philosophies that were interpreted into naval strategies/doctrines, budgetary concerns which shaped force realities, and the pursuit of American diplomatic objectives. It concludes with a discussion of the Navy's strategic and structural changes

post-Cold War, the evolution of its focus, mission, and strategy both in the post-September 11, 2001 world and post-Global War on Terrorism era.

NAVY 2120a, Leadership and Management Sean Cooper
A study of leadership, ethics, resource management, and organizational behavior, with emphasis on situations commonly encountered by junior officers in the naval service. Classical theories of management, motivation, and communication; development of skills in organizational thinking and problem solving. Required for second-year NROTC students. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

NAVY 3110a, Naval Engineering Paige Miles
An overview of Naval engineering systems and a detailed study of the principles behind ship construction. Topics include ship design, hydrodynamic forces, stability, conventional and nuclear propulsion, electrical theory and systems, interior communications, damage control, hydraulics, and ship control. Basic concepts in the theory and design of steam, gas turbine, and diesel propulsion. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

NAVY 4110a, Naval Operations and Seamanship Nick Gioia
Study of relative motion, formation tactics, and ship employment. Introductions to Naval operations and operations analysis, ship behavior and characteristics in maneuvering, applied aspects of ship handling, afloat communications, Naval command and control, Naval warfare areas, and joint warfare. Analysis of case studies involving related moral, ethical, and leadership issues. Prerequisites: NAVY 111 and 112. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

Near Eastern Languages and Civilizations (NELC)

* **NELC 0040b, Earliest Literature of the Ancient World** Benjamin Foster
Selections from ancient Near Eastern literature, such as myths and epics, stories, fables, letters, magic spells, and poetry, with emphasis on themes that resonate with a modern reader: memory, entertainment, success, love, heroism, violence, suffering, redemption, devotion, faith, sexuality, anxiety, humor, wonder, cynicism, and going to school. Enrollment limited to first-year students. HU

* **NELC 0090a / HUMS 0245a, Six Global Perspectives on Evil: Murder, Law, and True Crime in History** Staff
Harem conspiracies, kings' assassinations, self-defense killings, witch hunts, and serial murderers. The history of murder, violence, and criminal investigation is as old as humankind. Yet, crime is not always considered evil, nor is evil always associated with crime. In this course, we discuss how the way evil was perceived and crime was punished has changed throughout history. From mythical accounts of murders, to real records of trials of humans, animals, and even objects accused of homicide

or witchcraft, we analyze how aspects of social status or gender played a role in shaping punishment across Eastern and Western civilizations. We compare codified-law civilizations to those in which custom, social pressure, and community ethics determined correct behavior. Four historical cold cases with accompanying evidence are presented for in-class debate, and… perhaps students may be able to help solve an old mystery! At the end of the semester, we recreate historical trials using the same crime, evidence, and participants, but following the law and procedures of each one of the historical settings covered in this course. Will the verdict and sentence be any different? Friday sessions alternate between writing workshops and field trips to Yale collections. Enrollment limited to first-year students. Students enroll concurrently with HUMS 0299, Six Global Perspectives Lab. WR, HU RP 1½ Course cr

* **NELC 157b and NELC 1570b / JDST 3060b / MMES 1157b, Israeli Narratives** Shiri Goren

This course looks at contemporary representations of social, political, and domestic space in Israel through cultural production such as literature, visual work, and art. It focuses on close reading of major Israeli works in translation with attention to how their themes and forms relate to the Israeli condition. Reading and viewing include: Amos Oz's major novel A Tale of Love and Darkness, *Anne Frank: The Graphic Diary*, Maya Arad's novella "The Hebrew Teacher," TV show *Arab Labor* and writing by Yehudah Amichai, Etgar Keret, and Sayed Kashua, among others. We discuss topics and theories of personal and collective identity formation, war and peace, ethnicity and race, migration, nationalism, and gender. No knowledge of Hebrew required. WR, HU TR

* **NELC 323b and NELC 3230b / CPLT 1960b / JDST 3812b / MMES 3312b, Hebrew Poetry in Muslim Spain** Peter Cole

Introduction to the Golden Age of Hebrew poetry in Muslim Andalusia from the tenth century through the twelfth. Major figures of the period and the cultural and philosophical questions they confronted. The Judeo-Arabic social context in which the poetry emerged; critical issues pertaining to the study and transmission of this literature. Readings from the works of several poets. Readings in translation. Additional readings in Hebrew available. HU

* **NELC 1040b / HSAR 3270b, Art and Visual Culture in Ancient Egypt and Mesopotamia** Kathryn Slanski

In this course we investigate and compare the stunning visual culture of both ancient Egypt and Mesopotamia. We look into the purpose and function of 'art' in these two ancient societies, the intended audiences and the stylistic development of many different kinds of art, from sculpture to two-dimensional representations. We are planning for visits to West Campus to look at actual objects from the Peabody collections, the Yale Babylonian Collection, and (Covid-19 restrictions permitting) we are planning a trip to the Metropolitan Museum of Art. Additional aspects that are addressed in this course concern restoration and cultural heritage issues such as looting and repatriation of artifacts to their country of origin. HU

NELC 1200b / ANTH 1200b / HUMS 1210b, Unequal: Dynamics of Power and Social Hierarchy in Ancient Egypt and Mesopotamia Gojko Barjamovic

The course "Unequal" examines the historical roots of intolerance, slavery, and imperialism, emphasizing how our perceptions of history shape contemporary beliefs and policies. It challenges the notion that inequality is an inevitable outcome of societal

complexity, positing that historical narratives often frame progress and freedom while obscuring themes of inequality. By investigating early human history, the course aims to unpack the concepts of identity, possession, value, freedom, and power, exploring their impact on modern society. Rather than focusing on specific literature or chronological period, "Unequal" centers around critical questions about human culture. The course employs innovative experimental lab assignments, allowing students to engage with the past creatively, such as cooking ancient recipes, brewing beer, and creating virtual museum exhibits. This interdisciplinary approach encourages a deeper understanding of the historical context that informs present-day issues, inviting students to rethink common narratives and assumptions about equality and progress. Ultimately, the course aims to foster critical thinking about the interplay between history and contemporary society. HU, SO 0 Course cr

NELC 1210a / HUMS 1400a, The Hero in the Ancient Near East Kathryn Slanski
This course is an introduction to of ancient Near Eastern civilization through the prism of its heroes, figures at the intersection of literature, religion, history, and art. While our principle focus is on heroes from ancient Mesopotamia and the Hebrew Bible, students will also have opportunities to compare contemporary heroes to the ANE hero, and to consider if the ANE hero has a modern legacy. WR, HU 0 Course cr

NELC 1250b, Ancient Mesopotamia: The First Half of History Eckart Frahm
An introduction to the history and culture of the peoples and societies of ancient Iraq, from 3500 BCE to 75 CE, with a focus on Sumer, Babylonia, and Assyria. Students explore the origins and development of core features of Mesopotamian civilization, many still with us, from writing, literature, law, science, and organized religion to urbanism, long-distance trade, and empire. Readings (in translation) include the *Epic of Gilgamesh*, the *Babylonian Epic of Creation*, liver omens from King Ashurbanipal's famous library, cuneiform letters and legal documents, as well as the world's earliest cookbooks, housed in the Yale Babylonian Collection. HU 0 Course cr

* **NELC 1280a / CPLT 2000a / HUMS 1280a, From Gilgamesh to Persepolis: Introduction to Near Eastern Literatures** Kathryn Slanski
This course is an introduction to Near Eastern civilization through its rich and diverse literary cultures. We read and discuss ancient works, such as the *Epic of Gilgamesh*, *Genesis*, and "The Song of Songs," medieval works, such as *A Thousand and One Nights*, selections from the *Qur'an*, and *Shah-nama: The Book of Kings*, and modern works of Israeli, Turkish, and Iranian novelists and Palestinian poets. Students complement classroom studies with visits to the Yale Babylonian Collection and the Beinecke Rare Book and Manuscript Library, as well as with film screenings and guest speakers. Students also learn fundamentals of Near Eastern writing systems, and consider questions of tradition, transmission, and translation. All readings are in translation. Permission from the instructor required. WR, HU

* **NELC 1290b / RLST 2510b, Magic and Ritual in Ancient Egypt and the Near East** John Darnell
Introduction to ancient Egyptian magic and rituals with an overview on the use of magic and discussion of the different rituals and festivals attested in Ancient Egypt and the Near East. HU

* **NELC 1300b / CLCV 1381b / HUMS 434b, Mesopotamia's Literary Legacy** Kathryn Slanski

This seminar explores myth, epic, love poetry, and wisdom literature from the ancient Near East, ca. 3000–323 BCE, within its own cultural context and in dialogue with literature from ancient Greece and the Hebrew Bible, conduits by which the literary legacy of the ancient Near East has left its mark on the Western tradition. HU

NELC 1330a, Beginnings of Business: A History of Early Trade Gojko Barjamovic

When did trade begin? When did business go global? How has the organization of commerce changed through time? What are our fundamental financial instruments and how and in what order where they developed? Are there fundamental rules behind the way in which humans conduct business? What roles have states and institutions historically played in facilitating or restricting trade? What sources and approaches are available to study trade in pre-modern times? Can business innovations from the past help us think about business in the present? To explore all these questions, this class draws upon data and case-studies drawn broadly from the ancient world but with focus on evidence from ancient Mesopotamia. With the benefit of a giant canvas of history we paint a detailed picture of how business developed through time. We look at examples where business was strictly regulated by state-controlled institutions as well as examples entrepreneurs would have to rely on informal enforcement mechanisms, such as kin-relationships and reputation in repeated interactions. We dive into the effects of shock on individuals and systems—from production shortages to pandemics. And we ask what happens when systems collapse, or value becomes immeasurable (as people have claimed for the 2008 crash). We study family-controlled business groups as an alternative to integrated and professionally managed corporations. And we observe how entrepreneurs adapted to face the financial challenges of states and dawning globalization. This course immerses students in the history of trade and draws on guests from widely different fields and disciplines to showcase the variety of approaches with which scholars address questions of business history. HU, SO

* **NELC 1690a / CLCV 2391a, Visible Language: The Origins of Writing in Mesopotamia and Ancient Egypt** Klaus Wagensonner

Exploration of writing in the ancient Near East and the profound effects this new method of communication had on human society. Focus on Egypt and Mesopotamia, where advanced writing systems first developed and were used for millennia, with consideration of Chinese, Mayan, and Indus Valley writing systems as well. Previously NELC 168. HU

NELC 2430a / ARCG 2345a, Archaeology of Ancient Egypt—The Age of the Pyramids Gregory Marouard

This lecture course introduces the archaeology of ancient Egypt, beginning with an overview of the environment, climate, and history of the discipline, as well as the new archaeological methods used in contemporary fieldwork in Egypt. The course then explores ancient Egypt's origins, starting with the Predynastic and Early Dynastic Periods (5300–2800 BCE) and continuing chronologically to the great pyramids of the Old Kingdom (2800–2055 BCE) and the Middle Kingdom (2055–1700 BCE). It covers the historical framework, the evolution of ancient Egyptian art and architecture, and material culture, and includes specific case studies of important archaeological sites and discoveries. This course is the first of two introductory lecture courses. However, it is

not necessary to take both parts, and the order in which you take them does not matter. Discussion sections are included. HU 0 Course cr

* **NELC 2440b / ARCG 2242b, Ancient Egyptian Materials and Techniques: Their Histories and Socio-Economic Implications** Gregory Marouard

This seminar investigates in detail ancient Egyptian materials, techniques, and industries through the scope of archaeology, history, and socioeconomical, textual as well as iconographic data. When possible ethnoarchaeological and experimental approaches of the antique chaine-operatoire are discussed in order to illustrate skills and professions that have now completely disappeared. This class is organized according to various themes within a diachronical approach, from the 4th millennium BC to the Roman Period. Copper and precious metals, construction stones, hard stones and gems, glass and faience production, imported wood or ivory, we explore multiple categories of materials, where and how they were collected or exchanged, the way these products were transported, transformed, refined or assembled and the complex organization of the work involved and administration that was required in order to satisfy the tastes of Egyptian elites or their desires to worship their gods. Some other vernacular savoir-faire linked to the everyday life and the death is explored, through food production and mummification practices. The aim of this seminar is not only to give an overview of the history of techniques for this early civilization but, beyond how things were made, to acquire a more critical view of ancient Egyptian culture through the material culture and as well the strong economic and sociologic implications linked to their objects and constructions–rather than the usual focus on its temples and tombs. HU

* **NELC 2620a / RLST 2120a, Death, Memorial, and Immortality in the Hebrew Bible and its World** Jacqueline Vayntrub

What does the Hebrew Bible have to say about human mortality, divine immortality, and the afterlife? Are these ideas more consistent with later Jewish and Christian notions of death and the afterlife, or are they closer to the views of their ancient Near Eastern neighbors? In this course we examine the development of biblical and ancient Near Eastern concepts of death and life-after-death. We look at a variety of different types of texts that touch upon these themes, such as narrative, poetry, ritual, and law in biblical and other ancient Near Eastern texts. Topics include the depiction of human mortality and divine immortality in literature, dying as a social process, the development of the notion of an afterlife and the concept of the 'soul', and communication with the dead, how these texts have been received in the West, and how they have shaped inherited ideas of the immortality of the soul, human suffering, and divine justice. The aim of the course is to develop an awareness of the ancient historical and cultural context in which these texts were authored, and to deepen our understanding of modern views of mortality. HU

* **NELC 3210b / ANTH 4292b / ARCG 4292b, Imaging Ancient Worlds in Museum Collections** Klaus Wagensonner and Agnete Lassen

What is Digitization of Cultural Heritage? What are its merits, challenges, and best practices? The course highlighst the documentation and interpretation of archaeological artifacts, in particular artifacts from Western Asia. The primary goal of the course is the use of new technologies in computer graphics, including 3D imaging, to support current research in archaeology and anthropology. The course does put particular emphasis on the best practices of digitizing artifacts in collections. The prime study

subjects are the artifacts housed in the Yale Babylonian Collection (https://babylonian-collection.yale.edu). For some background information on the Collection see here. Students engage directly with the artifacts while practicing the various imaging techniques. HU 0 Course cr

* **NELC 3250a / CPLT 3880a / HUMS 2740a, The Education of Princes: Medieval Advice Literature of Rulership and Counsel** Shawkat Toorawa
In this course we read "mirrors for princes," a type of political writing by courtiers and advisors. The genre flourished in the courts of medieval Europe and the Islamic world. We learn about the ethical and moral considerations that guided (or were meant to guide) rulers in their conduct, in the formulation of their policies, and about theories of rule and rulership. The works we read are from several cultural, religious, and political traditions, and include: Christine de Pizan, *A Medieval Woman's Mirror of Honor*; Einhard, *Life of Charlemagne*; Erasmus, *Education of a Christian Prince*; Ibn al-Muqaffa', *Kalilah and Dimnah,* John of Salisbury, *Policraticus: Book of the Statesman*; Machiavelli, *The Prince*; Nizam al-Mulk, *The Book of Government.* All texts are in English translation. Instructor permission is required. HU

* **NELC 4530b / ARBC 4500b / LING 3270b, History of the Arabic Language** Kevin van Bladel
This course covers the development of the Arabic language from the earliest epigraphic evidence through the formation of the Classical 'Arabiyya and further, to Middle Arabic and Neo-Arabic. Readings of textual specimens and survey of secondary literature. Prerequisite: ARBC 1400 and permission of instructor.

* **NELC 4580a / RLST 4450a, Introduction to Arabic and Islamic Studies** Travis Zadeh
Comprehensive survey of subjects treated in Arabic and Islamic studies, with representative readings from each. Methods and techniques of scholarship in the field; emphasis on acquiring familiarity with bibliographical and other research tools. Enrollment limited to senior majors in Near Eastern Languages and Civilizations, except by permission of instructor. Previously NELC 490.

* **NELC 4710a, Directed Reading and Research** Shawkat Toorawa
For students who wish to pursue a topic or body of texts not available in the department's regular curriculum. Approval of the plan of study by both the director of undergraduate studies and a member of the department who agrees to serve as instructor is required. Student and instructor meet regularly throughout the term. The course culminates in either a piece of written work or a final examination.

* **NELC 4920a and NELC 4930b, The Senior Essay** Shiri Goren
Preparation of a research paper of at least thirty pages (sixty pages for a two-term essay) under the supervision of a departmental faculty member, in accordance with the following schedule: (1) by the end of the second week of classes of the fall term, students meet with advisers to discuss the topic, approach, sources, and bibliography of the essay. Note: students planning to write the essay in the second term (NELC 4930) should also meet with their prospective advisers by this deadline; (2) by the end of the fourth week of classes a prospectus with outline, including an annotated bibliography of materials in one or more Near Eastern languages and of secondary sources, is signed by the adviser and submitted to the director of undergraduate studies. The prospectus should indicate the formal title, scope, and focus of the essay, as well

as the proposed research method, including detailed indications of the nature and extent of materials in a Near Eastern language that will be used; (3) at the end of the tenth week of classes (end of February for yearlong essays), a rough draft of the complete essay is submitted to the adviser; (4) two copies of the finished paper must be submitted to the director of undergraduate studies, Rm HQ 604, by 4 p.m. on the last day of reading period. Failure to comply with the deadline will be penalized by a lower grade. Senior essays will be graded by departmental faculty unless, for exceptional reasons, different arrangements for an outside reader are made in advance with the director of undergraduate studies and the departmental adviser.

Neuroscience (NSCI)

NSCI 1600a / NSCI 160 / PSYC 160 / PSYC 1600a, The Human Brain Robb Rutledge

Introduction to the neural bases of human psychological function, including social, cognitive, and affective processing. Preparation for more advanced courses in cognitive and social neuroscience. Topics include memory, reward processing, neuroeconomics, individual differences, emotion, social inferences, and clinical disorders. Neuroanatomy, neurophysiology, and neuropharmacology are also introduced. SC

* **NSCI 2400b / PSYC 2600b, Research Methods in Human Neuroscience** Gregory McCarthy

Primary focus on structural, functional, and diffusion magnetic resonance imaging, with a secondary emphasis upon brain stimulation, electroencephalography, and evoked potentials. Students learn the fundamentals of each method and the experimental designs for which they are most applicable. Prerequisites: PSYC 160/NSCI 160 and a course in statistics, or permission of instructor. SC

* **NSCI 2600a / PSYC 2760a, Research Methods in Psychopathology: Psychotic Disorders** Tyrone Cannon

Methods of research in psychopathology. Focus on longitudinal designs, high-risk sampling approaches, prediction of outcomes, and modeling change over time. Students design and perform analyses of clinical, cognitive, genetic, neuroimaging and other kinds of measures as predictors of psychosis and related outcomes, using existing datasets supplied by the instructor. SO

* **NSCI 2700a / NSCI 270 / PSYC 2670a, Research Methods in Cognitive Neuroscience** Stephanie Lazzaro

This course introduces methods used by cognitive neuroscientists to discover the structural and functional features of the nervous system. A combination of lectures and hands-on lab activities help students understand the structure and function of the human brain. WR, SC

NSCI 3200a / MCDB 3200a, Neurobiology Haig Keshishian and Harry McNamara

The excitability of the nerve cell membrane as a starting point for the study of molecular, cellular, and systems-level mechanisms underlying the generation and control of behavior. At least 1 semester of college chemistry is strongly recommended. SC 0 Course cr

NSCI 3210La / MCDB 3210La, Laboratory for Neurobiology Haig Keshishian
Introduction to the neurosciences. Projects include the study of neuronal excitability, sensory transduction, CNS function, synaptic physiology, and neuroanatomy. Concurrently with or after MCDB 320. SC ½ Course cr

NSCI 3240a / BENG 3230a / MB&B 3300a and MB&B 3310a / MB&B 3310a / MCDB 3310a, Modeling Biological Systems I Thierry Emonet and Kathryn Miller-Jensen
Biological systems make sophisticated decisions at many levels. This course explores the molecular and computational underpinnings of how these decisions are made, with a focus on modeling static and dynamic processes in example biological systems. This course is aimed at biology students and teaches the analytic and computational methods needed to model genetic networks and protein signaling pathways. Students present and discuss original papers in class. They learn to model using MatLab in a series of in-class hackathons that illustrate the biological examples discussed in the lectures. Biological systems and processes that are modeled include: (i) gene expression, including the kinetics of RNA and protein synthesis and degradation; (ii) activators and repressors; (iii) the lysogeny/lysis switch of lambda phage; (iv) network motifs and how they shape response dynamics; (v) cell signaling, MAP kinase networks and cell fate decisions; and (vi) noise in gene expression. Prerequisites: MATH 115 or 116. BIOL 101–104, or with permission of instructors. This course also benefits students who have taken more advanced biology courses (e.g. MCDB 200, MCDB 310, MB&B 300/301). QR, SC 0 Course cr

NSCI 3290a / MCDB 3290a, Sensory Neuroscience Through Illusions Damon Clark and Michael O'Donnell
Animals use sensory systems to obtain and process information about the environment around them. Sensory illusions occur when our sensory systems provide us with surprising or unexpected percepts of the world. The goal of this course is to introduce students to sensory neuroscience at the levels of sensor physiology and of the neural circuits that process information from sensors. The course is centered around sensory illusions, which are special cases of sensory processing that can be especially illustrative, as well as delightful. These special cases are used to learn about the general principles that organize sensation across modalities and species. Prerequisites: BIOL 101–104; NSCI 160 or NSCI 320 or permission of instructor. SC

NSCI 3380b / CGSC 3380b / PSYC 3380b, Minds, Brains, and Machines Julian Jara-Ettinger
Leibniz compared the brain to a mill, Freud to a hydraulic system, and now we think of it as a computer. Have we gotten it right? If so, what kind of computer is the brain? And what kind of software is the mind? This course explores these questions by integrating classical and cutting-edge findings from artificial intelligence, cognitive science, neuroscience, philosophy, and psychology. In this course you learn how modern artificial intelligence works—including deep neural networks, program synthesis, and neuro-symbolic approaches. You learn how to think about artificial intelligence from the perspectives of cognitive science and neuroscience. And you learn how current advances in AI are helping us understand how the mind and brain works. Conversely, you also learn how advances in psychology and neuroscience have played a key role in the biggest ideas in AI. This course is ideal for a variety of students: Psychology and cognitive science majors that want to learn about AI. CS

students that want to know how to think about AI from a cognitive perspective. And anyone who wants to know how to think critically about all the advances in the study of minds, brains, and machines. Students are strongly encouraged to have taken either Introduction to Psychology (PSYC 110), or Introduction to Cognitive Science (CGSC 110). Introduction to Computer Science (CPSC 201) is also ideal. SO

NSCI 3400b / PSYC 3635b, Cognitive Neuroscience Steve Chang
This course covers how cognition is made by the brain. Students learn brain mechanisms underlying human cognition, including making decisions, paying attention, regulating emotion, remembering events, as well as understanding others. The course discusses both established and newly emerging findings based on several landmark experiments in both humans and animals. During this process, students are also introduced to cutting-edge techniques in cognitive neuroscience for studying human cognition. Prerequisite: PSYC 160 or specific chapter readings from the instructor. SC

NSCI 3550b / PSYC 3630b, Social Neuroscience Stephanie Lazzaro
Exploration of the psychological and neural mechanisms that enable the formation, maintenance, and dissolution of social relationships. Topics include the neuroscience of how we form impressions and decide whether to instigate relationships with others; how we build relationships through trust, cooperation, attachment, conflict, and reconciliation; and group-level processes including intergroup bias, moral judgment, and decision making. Prerequisite: PSYC 160 SC

NSCI 3610a / CGSC 274 / CGSC 2740a / PSYC 2610a, Algorithms of the Mind Ilker Yildirim
This course introduces computational theories of psychological processes, with a pedagogical focus on perception and high-level cognition. Each week students learn about new computational methods grounded in neurocognitive phenomena. Lectures introduce these topics conceptually; lab sections provide hands-on instruction with programming assignments and review of mathematical concepts. Lectures cover a range of computational methods sampling across the fields of computational statistics, artificial intelligence and machine learning, including probabilistic programming, neural networks, and differentiable programming. Students must have a fairly strong programming background, ideally in a high-level programming language such as Julia, Python or C++. (The course will use Julia and Python substantially). Familiarity with bash scripting and HPC use are desirable. College-level calculus is required, in addition to some exposure to probability and Bayesian inference, or more broadly (probabilistic) machine learning. QR, SC, SO 0 Course cr

* **NSCI 4400b / CBIO 4200b / CGSC 4200b / PSYC 4200b, Topics in Clinical Neuroscience** Tyrone Cannon
An overview and examination of the neuroscience of psychiatric illness. We focus on cutting-edge research in humans and animals aimed at understanding the biological mechanisms that underlie psychiatric illness. Although these questions date back to early philosophical texts, only recently have experimental psychologists and neuroscientists begun to explore this vast and exciting domain of study. We discuss the evolutionary and developmental origins of individual differences in human personality, measurement issues, fundamental dimensions of psychopathology, stability/plasticity, heritability, and implications therapeutic interventions as well as the associated broader implications for public policy. A major focus is on the neurobiology of fear and anxiety,

including brain circuits, molecular genetic pathways, and epigenetics. A secondary focus is on differences in behavior and biology that confer risk for the development of depression and addiction, including the biological systems involved in hedonic pleasure, motivated goal pursuit, and the regulation of impulses in the face of everyday temptation. Students should have some background in psychology; PSYC 110 and PSYC 160 preferred. SO

* **NSCI 4420b / PSYC 4280b, Neuroscience of Decision-Making** Stephanie Lazzaro
An overview and examination of the neuroscience of decision making. Interdisciplinary course highlighting research from cognitive neuroscience, psychology, behavioral economics, finance, marketing, computer science, and public health. Topics include utility and value, reinforcement learning, risky decision making, impulsivity and self control, social decision making, psychopathology, and commercial applications (e.g., neuromarketing and neurofinance). Permission of the instructor. SC

* **NSCI 4430a / NSCI 443 / PSYC 4430a, Topics in the Neuroscience of Memory** Stephanie Lazzaro
A seminar style overview and examination of the neuroscience of memory. In this seminar, we discuss some significant historical findings in the study of memory, as well as focus on more recent, current research. How memory works and how memories can be altered and improved are discussed. Topics may include sleep and memory consolidation, re-consolidation, false memories, superior autobiographical memory, as well as the the effects of rewards, novelty, exercise, and social cues on various types of memory. Goals for this course include acquiring an in-depth and integrative understanding of the current research and directions surrounding the neuroscience of memory, and thinking critically about the methodology and evidence in the research papers that are read and discussed. We discuss strengths and limitations of the research and theories, as well as real-world applications. Prerequisites: PSYC 110, PSYC 160, or PSYC 130

* **NSCI 4490a / PSYC 4490a, Neuroscience of Social Interaction** Steve Chang
This seminar covers influential studies that inform how the brain enables complex social interactions from the perspectives of neural mechanisms. Students thoroughly read selected original research papers in the field of social neuroscience across several animal species and multiple modern neuroscience methodologies. In class, the instructor and students work together to discuss these studies in depth. Focused topics include neural mechanisms behind brain-to-brain coupling, empathy, prosocial decision-making, oxytocin effects, and social dysfunction. Prerequisite: PSYC 160 or permission from the instructor. SC

* **NSCI 4550a / PSYC 4320a, Under Pressure: The Psychology of Stress** Dylan Gee
While stress serves an adaptive function that is critical for survival, chronic or extreme stress can have a negative impact on mental and physical health. Understanding the broad range of factors that can exacerbate or reduce stress, how we respond to stress, and the ways that experiences and effects of stress can differ across people and across stages of development can provide foundational insights for dealing with stress in our lives. This seminar integrates psychological, neurobiological, social, developmental, and clinical perspectives on stress. In addition to developing a foundation in the theoretical and empirical literature on stress, students will have the opportunity to engage in experiential learning related to coping skills drawn from evidence-based interventions in psychology. Priority given to seniors. Prerequisites: There are no formal prerequisites

for the course, but one of the following is strongly recommended: PSYC 110, PSYC 160, PSYC 230, PSYC 335, PSYC 352, or PSYC 376. SO

* **NSCI 4700a, Independent Research** Damon Clark and Steve Chang
Research project under faculty supervision taken Pass/Fail; does not count toward the major, but does count toward graduation requirements. Students are expected to spend approximately ten hours per week in the laboratory. A final research report and/or presentation is required by end of term. Students who take this course more than once must reapply each term. To register, students must submit a form and written plan of study with bibliography, approved by the faculty research adviser and DUS, by the end of the first week of class. More detailed guidelines and forms can be obtained from http://neuroscience.yale.edu.

* **NSCI 4790b / PSYC 4790b, Computational Basis of Seeing and Thinking** Ilker Yildirim
This seminar aims to discuss the computational basis of seeing and thinking in the mind and brain. The course be organized around three central questions in brain and cognitive sciences. First, we start with this question of how perception gets us to cognition: How is it that perception transforms raw, unstructured incoming sensory signals arising from our physical environments—the light that bounces off surfaces and arrives at the retina, raw audio waves hitting the ears, or the vibro-tactile sensations felt at the fingertips when touching a surface—into things like objects, scenes, events, and agents, into things that we can think about? We draw upon readings and classroom discussions, primarily computational literature, to explore representational and algorithmic hypothesis about seeing and thinking in the mind. Second, we observe that these cognitive hypotheses about mental representations are typically developed in rather sterile, or as scientists we like to call it "controlled", settings. We proceed to ask how these cognitive hypotheses about mental representations can be scaled to the messiness and complexity of the real world. This leads us to issues at the intersection of AI, psychology, and cognitive science. Finally, we observe that in most cases, cognitive representations about mental representations don't plausibly or at least readily map onto a brain implementation. So, we ask: How is it that through the distributed and dynamic activity in our brain's neural circuits, we come to think thoughts about objects and agents, mentally simulate what will happen next, and plan actions accordingly? We explore multi-level theories of intelligence, that make bridges across AI, neuroscience and cognitive science. SO

* **NSCI 4800a, Senior Non-empirical Research** Damon Clark and Steve Chang
Research survey under faculty supervision fulfills the senior requirement for the B.A. degree and awards a letter grade. For NSCI seniors only (and second term juniors with DUS permission). Students are expected to conduct a literature review, to complete written assignments, and to present their research once in either the fall or spring term. Students are encouraged to pursue the same research project for two terms. The final research paper is due in the hands of the sponsoring faculty member, with a copy submitted to the department, by the stated deadline near the end of the term. To register, students submit a form and written plan of study with bibliography, approved by the faculty research adviser and DUS, by the end of the first week of classes. More detailed guidelines and forms can be obtained from http://neuroscience.yale.edu.

* **NSCI 4900a and NSCI 4910a, Senior Empirical Research** Damon Clark and Steve Chang

Laboratory or independent empirical research project under faculty supervision to fulfill the senior requirement for the B.S. degree. For NSCI seniors only (and second term juniors with DUS permission); this course awards a letter grade. Students are expected to spend at least ten hours per week in the laboratory, to complete written assignments, and to present their research once in either the fall or the spring term. Written assignments include a short research proposal summary due at the beginning of the term and a full research report due at the end of the term. Students are encouraged to pursue the same research project for two terms, in which case, the first term research report and the second term proposal summary may be combined into a full research proposal due at the end of the first term. Final papers are due by the stated deadline. Students should reserve a research laboratory during the term preceding the research. To register, students must submit a form and written plan of study with bibliography, approved by the faculty research adviser and DUS, by the end of the first week of classes. More detailed guidelines and forms can be obtained from http://neuroscience.yale.edu.

Ottoman (OTTM)

* **OTTM 2300b, Reading and Research in Ottoman History and Literature** Ozgen Felek

This is a text reading course. The course aims to introduce students to a variety of historical and literary Ottoman texts and documents from the fourteenth to nineteenth centuries. We read and analyze excerpts from original Ottoman texts, such as the chronicles, heroic narratives, advice books, physiognomy texts, travel accounts, and hagiographical stories. The students participating in the course develop skills that enable them to read Ottoman Turkish texts and pursue independent work in Ottoman studies.

Persian (PERS)

PERS 1100a, Elementary Persian I Farkhondeh Shayesteh

Introduction to modern Persian, with emphasis on all four language skills: reading, writing, listening, and speaking. L1 1½ Course cr

PERS 1200b, Elementary Persian II Farkhondeh Shayesteh

Continuation of PERS 1100, with emphasis on all four language skills: reading, writing, listening, and speaking. Prerequisite: PERS 1100 or permission of instructor. L2 1½ Course cr

PERS 1300a, Intermediate Persian I Farkhondeh Shayesteh

Continuation of PERS 1200, with emphasis on expanding vocabulary and understanding more complex grammatical forms and syntax. Prerequisite: PERS 1200 or permission of instructor. L3 1½ Course cr

PERS 1400b, Intermediate Persian II Farkhondeh Shayesteh

Continuation of PERS 1300, with emphasis on expanding vocabulary and understanding more complex grammatical forms and syntax. Prerequisite: PERS 1300 or permission of instructor. L4 1½ Course cr

*** PERS 1500a / MMES 1152a, Thematic Survey of Modern Persian Literature**
Farkhondeh Shayesteh
A content-base advanced course focusing on continuing development of language skills for nonnative speakers. Emphasis on reading, writing, and discussion through modern Persian literary prose and poetry. PERS 1400 and permission from the instructor. L5, HU

Philosophy (PHIL)

*** PHIL 0050a, Philosophy, Race, and Racism** Robert Gooding-Williams
What is a race, and what is like to have a racial identity? Is racism best conceptualized as a form of flawed belief, as a moral vice, as a social practice, or in terms of notions like "racial oppression" and "white supremacy"? In addressing these questions, we survey and attempt to think along with—analytically, critically, and never dogmatically—the writings of some of the best philosophers who have attempted to answer them. These include W.E.B. DuBois, Jean-Paul Sartre, Frantz Fanon, Michel Foucault, and several contemporary philosophers. Enrollment is limited to first-year students. HU

PHIL 1115a, First-Order Logic Staff
An introduction to formal logic. Study of the formal deductive systems and semantics for both propositional and predicate logic. Some discussion of metatheory. QR
0 Course cr

PHIL 1118a / HUMS 4501a / RLST 1270a / SAST 2610a, Buddhist Thought: The Foundations Staff
This class introduces the fundamentals of Buddhist thought, focusing on the foundational doctrinal, philosophical, and ethical ideas that have animated the Buddhist tradition from its earliest days in India 2500 years ago down to the present, in places such as Tibet, China, and Japan. Though there will be occasional discussion of the social and practical contexts of the Buddhist religion, the primary focus of this course lies on how traditional Buddhist thinkers conceptualize the universe, think about the nature of human beings, and propose that people should live their lives. Our main objects of inquiry are therefore the foundational Buddhist ideas, and the classic texts in which those ideas are put forth and defended, that are broadly speaking shared by all traditions of Buddhism. In the later part of the course, we take up some of these issues in the context of specific, regional forms of Buddhism, and watch some films that provide glimpses of Buddhist religious life on the ground. HU 0 Course cr

PHIL 1119b / EALL 2190b / EAST 2201b / HUMS 214b / RLST 171b, Introduction to Chinese Philosophy Lucas Bender
This course represents an introduction to the most important philosophical thinkers and texts in Chinese history, ranging from roughly 500 BC–1500 AD. Topics include ethics, political philosophy, epistemology, and ontology. We discuss the basic works of Confucian and Daoist philosophers during the Warring States and early imperial eras, the continuation of these traditions in early medieval "dark learning," Buddhist philosophy (in its original Indian context, the early period of its spread to China, and in mature Chinese Buddhist schools such as Chan/Zen), and Neo-Confucian philosophy. The course emphasizes readings in the original texts of the thinkers and traditions in question (all in English translation). No knowledge of Chinese or previous contact with Chinese philosophy required. HU 0 Course cr

PHIL 1125a / CLCV 1901a, Introduction to Ancient Philosophy Staff
An introduction to ancient philosophy, beginning with the earliest pre-Socratics, concentrating on Plato and Aristotle, and including a brief foray into Hellenistic philosophy. Intended to be taken in conjunction with PHIL 126. WR, HU 0 Course cr

PHIL 1126b, Introduction to Modern Philosophy from Descartes to Kant Michael Della Rocca
An introduction to major figures in the history of modern philosophy, with critical reading of works by Descartes, Malabranche, Spinoza, Leibniz, Locke, Berkeley, Hume, and Kant. Intended to be taken in conjunction with PHIL 125, although PHIL 125 is not a prerequisite. HU 0 Course cr

PHIL 1175b, Introduction to Ethics Shelly Kagan
What makes one act right and another wrong? What am I morally required to do for others? What is the basis of morality? These are some of the questions raised in moral philosophy. Examination of two of the most important answers, the theories of Mill and Kant, with brief consideration of the views of Hume and Hobbes. Discussion of the question: Why be moral? HU 0 Course cr

PHIL 1177a / AFAM 1398a / CGSC 2770a / EDST 1177a, Propaganda, Ideology, and Democracy Staff
Historical, philosophical, psychological, and linguistic introduction to the issues and challenges that propaganda raises for liberal democracy. How propaganda can work to undermine democracy; ways in which schools and the press are implicated; the use of propaganda by social movements to address democracy's deficiencies; the legitimacy of propaganda in cases of political crisis. HU 0 Course cr

PHIL 1178a, Introduction to Political Philosophy Thomas Pogge
A survey of social and political theory, beginning with Plato and continuing through modern philosophers such as Rawls, Nozick, and Cohen. Emphasis on tracing the development of political ideas; challenges to political theories. HU

PHIL 1180b / PLSC 2103b, Ethics and International Affairs Thomas Pogge
Moral reflection taken beyond state boundaries. Traditional questions about state conduct and international relations as well as more recent questions about intergovernmental agencies, nongovernmental organizations, and the design of global institutional arrangements. HU

PHIL 1182a / CGSC 2820a / PSYC 1382a, Perspectives on Human Nature Staff
Comparison of philosophical and psychological perspectives on human nature. Nietzsche on morality, paired with contemporary work on the psychology of moral judgment; Marx on religion, paired with systematic research on the science of religious belief; Schopenhauer paired with social psychology on happiness. HU 0 Course cr

* **PHIL 2101b, Philosophy and the Origins of Modern Science** Claudia Dumitru
How (and when) was modern science born? What factors contributed to the transformation of natural philosophy into modern science? Is this development best described as a 'revolution'? This course focuses on the intellectual transformations that took place in 16th and 17th-century Europe and that came to be known as 'the Scientific Revolution.' Readings cover a mixture of philosophical texts, scientific texts, and contemporary scholarship from the history and philosophy of science. We discuss the experimental practices, mathematical tools, and competing philosophical frameworks

put forward by figures such as Bacon, Galileo, Descartes, Newton, and reflect on how the developments in this period shape our understanding of science today. HU

PHIL 2220a, Medieval Philosophy Paul Franks and Michael Lessman
Introduction to central problems and themes in medieval philosophy. The confrontation between Greek philosophy and the Abrahamic or scriptural religions of Judaism, Christianity, and Islam; conceptions in metaphysics, epistemology, philosophy of mind, and ethics to which the encounter gave rise. Philosophers include Augustine, Saadiah, al-Farabi, al-Ghazali, Maimonides, ibn-Rushd, Aquinas, Crescas, and Ockham. HU

PHIL 2267b, Mathematical Logic Sun-Joo Shin
An introduction to the metatheory of first-order logic, up to and including the completeness theorem for the first-order calculus. Introduction to the basic concepts of set theory. Prerequisite: PHIL 115 or permission of instructor. QR

PHIL 2269b, The Philosophy of Science Lily Hu
Central questions about the nature of scientific theory and practice. Factors that make a discipline a science; how and why scientific theories change over time; interpreting probabilistic claims in science; whether simpler theories are more likely to be true; the laws of nature; whether physics has a special status compared to other sciences; the legitimacy of adaptationist thinking in evolutionary biology. HU

PHIL 2270a, Epistemology Daniel Greco
Introduction to current topics in the theory of knowledge. The analysis of knowledge, justified belief, rationality, certainty, and evidence. HU

PHIL 2271a / LING 2710a, Philosophy of Language Zoltan Szabo
An introduction to contemporary philosophy of language, organized around four broad topics: meaning, reference, context, and communication. Introduction to the use of logical notation. HU 0 Course cr

PHIL 2275b, Minds and Machines Laurie Paul
This course explores the structure of the mind and brain in relation to topics in artificial intelligence, with special attention to topics in computational cognitive science. We discuss classic questions in the philosophy of mind involving representation, consciousness, intentionality, and knowledge, and explore connections to topics in AI involving computational models, machine learning, agency, planning, and reasoning. HU 0 Course cr

PHIL 2280b / CGSC 2750b / LING 2750b, Pragmatics Simon Charlow
Speakers often mean things they don't say, but how does a hearer figure out what the speaker meant? Which sentences are designed to change the world rather than just to represent it? How are sentences used to mean different things in different contexts? Pragmatics explores the relations between what is said and what is meant, focusing on how speech acts and the principles of "street logic"—presuppositions and implicatures—help speakers and hearers shape the landscape of a conversation. No formal prerequisites, but some familiarity with linguistics or philosophy of language will help on some of the readings. SO RP

* **PHIL 3208a / EP&E 4255a, Morality and Relationships** Max Lewis
This course explores the nuances of two kinds of relationships: interpersonal relationships and normative relationships. The course starts with foundational work in

relational ethics which connects ethics with moral accountability, e.g., moral demands, claims, blame, apology, forgiveness, etc. With a grasp of these views in place, we turn toward the morality of interpersonal relationships. Interpersonal relationships are a central part of our lives. As social creatures, they are essential for our well-being and the meaningfulness of our lives. But they raise important moral questions. For example, do we have special obligations to our friends, family, or co-national? Are we epistemically permitted to ignore evidence if it indicates that our friend or family has done something wrong? Is there a conflict between what morality requires and what is required for being a good friend or family member? What's wrong or bad about being friends with an immoral person? We also explore psychological and moral aspects of these relationships, e.g., what does loving a person consist of? What reasons do we have to love others? Do we owe our loved ones debts of gratitude? SO

* **PHIL 3305b / CGSC 313 / CGSC 3130b / PSYC 3113b, Philosophy for Psychologists** Joshua Knobe

Introduction to frameworks developed within philosophy that have applications in psychological research. Principal topics include the self, causation, free will, and morality. Recommended preparation: a course in philosophy or psychology. HU, SO

* **PHIL 3314a / EP&E 4234a, Contemporary Moral and Social Controversies: Freedom, Autonomy, Well-Being** Max Lewis

We are living in a time of moral turmoil. Not only have legal rights we took for granted been overturned (e.g., the right to abortion), but we seem more polarized than ever. In this course, we take a careful and sober look at some of the moral and social controversies that constitute this state of turmoil and polarization. At the heart of the course are debates concerning conflicts between the following rights and values that people in liberal democracies see as sacrosanct, e.g., autonomy (e.g., bodily autonomy), freedom (e.g., free speech and freedom of association), harm prevention, the right to life, and well being. We start by exploring the fundamental theories in morality (e.g., Consequentialism, Deontology, and Rights Theory) and well-being (e.g., Hedonism, Desire-satisfaction, and Objective List views). We then use these theories to critically analyze particular moral and social controversies. In particular, we explore how these theories answer the following questions, "Is abortion morally permissible?", "Is euthanasia morally wrong?", "Should there be limits on free speech? If so, when?", "Should there be limits on what can be bought and sold?", "Can the state be justified in interfering with who gets to parent children?", "How open should state borders be?", "What do we owe the global poor?" SO

* **PHIL 3323a / GMAN 3030a, The Frankfurt School** Jacob McNulty

The Frankfurt School of Critical Theory was (is) a group of eclectic interdisciplinary Marxist philosophers and social scientists, active from the 1920s to the present. Most were German Jews born around the turn of the 20th century. The Frankfurt school were a group of thinkers in almost perpetual exile. Simultaneously critical of American capitalism and of Soviet Communism, they were expelled from their native Germany in the wake of Hitler's rise to power. They also often lacked any intellectual safe haven, finding themselves at odds much philosophical and social-scientific orthodoxy (positivism, neo-Kantianism, "value-free" social science etc.). The critical theorists of the Frankfurt School sought to re-actualize ideas from the philosophical tradition, especially from Kant and Hegel, in order to address the complex realities of modern society: mass culture; fascism, totalitarianism and authoritarianism; world war;

imperialism; secularization; irrationality, sexuality and aggression; and so on. This class looks at critical theory from a philosophical perspective, focusing on its claim to fuse traditional philosophy and radical social science. At least one prior course in philosophy, preferably in Kant or political philosophy. HU

* **PHIL 3371a / HUMS 3371a / PLSC 3371a, Machiavelli and Machiavellianism** Steven Smith

It is generally agreed that modern political science begins with Machiavelli, but what that means remains a subject of considerable dispute. What were Machiavelli's accomplishments? Was he a political realist who taught us to seek for "the effectual truth" of things? Was he an advisor to princes or, at the very least, powerful executives who taught the importance of acting by "oneself alone"? Was he a populist who sought to reanimate a taste for Roman-style republicanism? Or did he seek to bring about a new kind of expansive territorial state fuelled by war and the desire for empire? Machiavelli's influence has been widespread throughout the modern world. But just because his writings have been used and misused for a range of causes does not mean that we cannot discover an intelligible and coherent core to his work. We read Machiavelli's two most important works of political theory—the *Prince* and the *Discourses on Livy*. The latter is read along with the Roman historian Titus Livy who was Machiavelli's major source for his theories of political conflict, leadership, and liberty. We then consider his influence on some selected nineteenth and twentieth-century political theorists who have appropriated him as the central figure of modernity. Throughout the course we are attentive to the interpretive and methodological issues at stake in the recovery of the thought of this great Florentine political thinker. SO

* **PHIL 3395a / CGSC 3950a, Junior Colloquium in Cognitive Science** Isaac Davis

Survey of contemporary issues and current research in cognitive science. By the end of the term, students select a research topic for the senior essay. Enrollment limited to Cognitive Science majors. ½ Course cr

* **PHIL 4220a, Philosophy of Causation in the Social World and the Social Sciences** Lily Hu

Billiard balls colliding. Rocks smashing bottles and windows. Striking a match to light it. Classic vignettes of causation in philosophy all feature causal relations in the physical world. But what about causation in the social world? Higher education causing higher earnings. Public health campaigns causing improved public health. Being fired because of one's race or sex. In this class, we: 1) explore the ways in which causation in the social world breaks the mold of those so-called "classic" cases of causation; 2) investigate the philosophical foundations of causal inference methodology in the social sciences; and 3) consider various normative dimensions of key causal relations in the social world. Prerequisite: One prior course in philosophy. HU

* **PHIL 4233a, Growing Up, Growing Old: Philosophy of Age and Aging** Robin Dembroff

This course examines the philosophical dimensions of age and aging, exploring questions of identity, justice, and the passage of time. How do we understand childhood, adulthood, and old age? What role do social norms play in shaping our experiences and perceptions of aging? Is aging a mere biological process, or does it have deeper ethical and existential significance? Drawing from metaphysics, ethics, feminist

philosophy, and critical age studies, we interrogate the ways age structures power, personhood, and our understanding of a life well lived. HU

* **PHIL 4240a, Practicing Philosophy** Robin Dembroff
What does it mean to practice philosophy, and will having a philosophical practice enrich your life? This course centers these questions. We approach philosophy not just as a body of knowledge but as an active, lived practice that takes many forms. Through readings, dialogue, and exercises, we both theoretically examine and actively imitate a range of philosophical traditions and methods—from meditation to debate, and dialogue to personal letters. As we explore these ways of doing philosophy, we consider how the form of a philosophical practice shapes the ideas and arguments that come out of that practice. By the end of this course, you gain a deeper appreciation of philosophy as a multifaceted and multitudinous practice, as well as a clearer sense of how you can integrate philosophical practice into your own life. HU

* **PHIL 4340b, The Philosophy of Thomas Hobbes** Claudia Dumitru
This is a seminar on Hobbes's theoretical and practical philosophy. We discuss his wider metaphysical and methodological commitments, his account of mind and human nature, and classic themes from his political philosophy. Particular attention is devoted to Hobbes's conception of a science of politics against the backdrop of his general theory of science. Prerequisites: two courses in philosophy (preferably 1 in the history of philosophy). HU

* **PHIL 4405a, Racial Inequality, Racial Injustice** Stephen Darwall and Robert Gooding-Williams
In this seminar we examine several contemporary, philosophical approaches to the themes of racial inequality and racial injustice, focusing on the relations between racial inequality and the metaphysics of race; between racial injustice and racial integration; between racial inequality and intimate injustice; and between racial inequality and the operations of caste and class hierarchies. Readings include writings by Sally Haslanger, Elizabeth Anderson, Tommie Shelby, Andrew Valls, Shatema Threadcraft, Stephen Darwall, Lionel McPherson, and Adolph Reed. At least one previous course in philosophy—preferably in moral, social, or political philosophy. HU

* **PHIL 4408a, The Ethics of Marx, Kierkegaard, and Nietzsche** Stephen Darwall
Marx, Kierkegaard, and Nietzsche were united by their critical attitude toward morality. Yet each had an ethical philosophy, even if it was only implicit, as in Marx. Moreover, there are themes that run through the thought of all three, though they differ profoundly from one another. For example, all three think and write in response to Kant and the German Idealists, Hegel and Fichte. And all three develop the idea of freedom, which was so important to Kant and post-Kantian Idealists. This course is an intensive study of the ethics of Marx, Kierkegaard, and Nietzsche: each in its own right, in comparison with each other, and in the context of the history of moral philosophy in the modern period, including up to the present time. One course in philosophical ethics advisable. HU

* **PHIL 4416b, The Philosophy of Spinoza** Michael Della Rocca
An in-depth study of Spinoza's philosophy. Readings from his *Ethics,* political writings, *Treatise on the Emendation of the Intellect,* letters, and other works. Spinoza's metaphysics and his views on philosophy of mind, teleology, action, and emotion. Some attention to methods for interpreting works in the history of philosophy. HU

* **PHIL 4425b, Topics in Epistemology** Keith DeRose
Survey of recent work in epistemology, with an emphasis on connections between formal approaches to epistemology and traditional epistemological questions. Bayesian approaches and their limitations; the relationship of credence to belief and knowledge; higher-order knowledge and probability. Prerequisite: a course in epistemology, or with permission of instructor. HU

* **PHIL 4426b / CGSC 4260b / EP&E 4490b / PSYC 4220b, The Cognitive Science of Morality** Joshua Knobe
Introduction to the emerging field of moral cognition. Focus on questions about the philosophical significance of psychological findings. Topics include the role of emotion in moral judgment; the significance of character traits in virtue ethics and personality psychology; the reliability of intuitions and the psychological processes that underlie them. HU

* **PHIL 4427b, Computability and Logic** Sun-Joo Shin
A technical exposition of Gödel's first and second incompleteness theorems and of some of their consequences in proof theory and model theory, such as Löb's theorem, Tarski's undefinability of truth, provability logic, and nonstandard models of arithmetic. Prerequisite: PHIL 267 or permission of instructor. QR, HU

* **PHIL 4450b / EP&E 4478b, The Problem of Evil** Keith DeRose
The challenge that evil's existence in the world poses for belief in a perfectly good and omnipotent God. The main formulations of the problem of evil; proposed ways of solving or mitigating the problem and criticism of those solutions. Skeptical theism, the free-will defense, soul-making theodicies, and doctrines of hell. HU

* **PHIL 4455b / EP&E 4334b, Normative Ethics** Shelly Kagan
A systematic examination of normative ethics, the part of moral philosophy that attempts to articulate and defend the basic principles of morality. The course surveys and explores some of the main normative factors relevant in determining the moral status of a given act or policy (features that help make a given act right or wrong). Brief consideration of some of the main views about the foundations of normative ethics (the ultimate basis or ground for the various moral principles). Prerequisite: a course in moral philosophy. HU

* **PHIL 4457b / EP&E 4235b / PLSC 3346b, Recent Work on Justice** Thomas Pogge
In-depth study of one contemporary book, author, or debate in political philosophy, political theory, or normative economics. Focus varies from year to year based on student interest and may include a ground-breaking new book, the life's work of a prominent author, or an important theme in contemporary political thought. HU

* **PHIL 4464a / PLSC 3324a, Justice, Taxes, and Global Financial Integrity** Thomas Pogge
Study of the formulation, interpretation, and enforcement of national and international tax rules from the perspective of national and global economic justice. Prerequisites: previous courses in one or two of the following: law, economics, political science, or political philosophy. HU

* **PHIL 4468b, Metaethics** Stephen Darwall
A study of moral theorizing and moral discourse. The linguistic role of words like good, bad, right, and wrong; whether propositions that use these terms can be true or false.

What ethical claims mean, if anything, and what kinds of reasoning or evidence might justify such claims. HU

*** PHIL 4480a or b, Tutorial** Daniel Greco
A reading course supervised by a member of the department and satisfying the following conditions: (1) the work of the course must not be possible in an already existing course; (2) the course must involve a substantial amount of writing, i.e., a term essay or a series of short essays; (3) the student must meet with the instructor regularly, normally for at least an hour a week; (4) the proposed course of study must be approved by both the director of undergraduate studies and the instructor.

*** PHIL 4483b / CLCV 4909, Plato's Metaphysics** Tim Clarke
A broad look at central topics in Plato's metaphysics followed by in-depth study of the conception of reality underlying the classificatory method at work in his *Sophist*, *Statesman,* and *Philebus*. Prerequisite: Previous study of ancient philosophy, Plato's philosophy, or permission of the instructor. HU

*** PHIL 4490a and PHIL 4491b, The Senior Essay** Daniel Greco
The essay, written under the supervision of a member of the department, should be a substantial paper; a suggested length is between 8,000 and 12,000 words for one-term projects, and between 12,500 and 15,000 words for two-term projects. Students completing a one-term project should enroll in either 490 in the fall or 491 in the spring. Students completing a two-term project should enroll in both 490 and 491. The deadline for senior essays completed in the fall is December 5; the deadline for both one- and two-term senior essays completed in the spring is April 21.

*** PHIL 4580a or b, Tutorial 2** Daniel Greco
A reading course supervised by a member of the department and satisfying the following conditions: (1) the work of the course must not be possible in an already existing course; (2) the course must involve a substantial amount of writing, i.e., a term essay or a series of short essays; (3) the student must meet with the instructor regularly, normally for at least an hour a week; (4) the proposed course of study must be approved by both the director of undergraduate studies and the instructor. none

Physics (PHYS)

*** PHYS 123Lb / MB&B 1230Lb / PHYS 1230Lb and PHYS 123Lb, Introduction to Physics in Living Systems III: Mechanics** Andrew Miranker
A hands-on introduction to the physics that enables life and human measurement of living things. The course focuses on the principles of mechanics at work in the biological sciences. This lab builds student knowledge, centering diffusion as an emergent phenomenon from elastic collisions, from which statistical mechanics is introduced. For students choosing to major in MB&B, this course may be used to fulfill the MB&B requirement for *Practical Skills* in physics. Priority for this 1/2 credit course is given to first-year students looking to fulfill medical school application requirements. It is helpful to take this course in the same semester as MB&B 124L. ½ Course cr

*** PHYS 0400a / ASTR 0400a, Expanding Ideas of Time and Space** Meg Urry
Discussions on astronomy, and the nature of time and space. Topics include the shape and contents of the universe, special and general relativity, dark and light matter, and dark energy. Observations and ideas fundamental to astronomers' current model of an

expanding and accelerating four-dimensional universe. Enrollment limited to first-year students. SC

* **PHYS 0500a / APHY 0500a / ENAS 0500a, Science of Modern Technology and Public Policy** Daniel Prober

Examination of the science behind selected advances in modern technology and implications for public policy, with focus on the scientific and contextual basis of each advance. Topics are developed by the participants with the instructor and with guest lecturers, and may include nanotechnology, quantum computation and cryptography, renewable energy technologies, optical systems for communication and medical diagnostics, transistors, satellite imaging and global positioning systems, large-scale immunization, and DNA made to order. Enrollment limited to first-year students. SC

* **PHYS 0700a, Nuclear Physics: The Good, The Bad, and the Misunderstood** Helen Caines

This course aims to introduce students to the basics of nuclear radiation and its uses. What exactly is radiation? How do we detect it? How come a little exposure can be good for us but too much deadly? Is nuclear energy a viable option? Is my cell phone dangerous? Should I get that dental x-ray? By the end of the course students are armed with necessary physics insights to answer the above questions and more. No prerequisites are required but completion of a high school physics course, or similar subject is preferred. Enrollment limited to first-year students. SC

* **PHYS 0800b and PHYS 1000b / APHY 0800b and APHY 1000b / ENAS 0800b / EPS 0800b / EVST 0080b and EVST 1000b, Energy, Environment, and Public Policy** Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non-science majors with strong backgrounds in math and science. Tours are be conducted of major examples of good energy design at Yale, including the Yale Power Plant and Kroon Hall. Students who take this course are not eligible to take APHY 100. Prerequisites: High school chemistry, physics, and Math. Calculus is not required. Enrollment limited to first-year students. QR, SC

PHYS 1060a / EVST 2206a / HIST 1727a / HSHM 2010a / HUMS 1060a, Sustainable Energy: Physics and History

Students explore the physical logic of energy and power in parallel with the histories of technology for energy exploitation and economic theories of sustainability on the path to modernity. They learn the fundamentals of quantitative analysis of contemporary and historical energy harvesting, its carbon intensity, and climate impact. They also gain an understanding of the historical underpinnings of the current global energy status quo and its relationship to economic theories of sustainability. Mathematical proficiency with algebra is assumed. Students from all academic interests and experiences are welcome in the course. QR, SC, SO 0 Course cr

* **PHYS 1070b / EDST 107 / EDST 3107b / MB&B 1070b, Being Human in STEM** Staff

A collaboratively designed, project-oriented course that seeks to examine, understand, and disseminate how diversity of gender, race, religion, sexuality, economic circumstances, etc. shape the STEM experience at Yale and nationally, and that seeks to formulate and implement solutions to issues that are identified. Study of relevant

peer-reviewed literature and popular-press articles. OpEd writing project and design and implementation of an intervention project focusing on improving belonging in Yale STEM communities. SO

* **PHYS 1200b, Quantum Physics and Beyond** Staff
Current topics in modern physics, beginning with quantum physics and continuing through subatomic physics, special and general relativity, cosmology, astrophysics, and string theory. SC

* **PHYS 1210La / MB&B 1210La, Introduction to Physics in Living Systems I: Observation and Analysis** Staff
A hands-on introduction to the physics that enables life and human measurement of living things. This lab builds student knowledge of scientific experimental design and practice. Topics include detection of light, basic circuit building, sterile technique in biology and physics, data collection with student-built instrumentation, and quantitative assessment. For students choosing to major in MB&B, this course may be used to fulfill the MB&B requirement for *Practical Skills* in physics. There are no prerequisites to this ½ credit class and it is helpful to take it in the same semester as MB&B 122L. Priority is given to first-year students looking to fulfill medical school application requirements and students seeking to join research labs at Yale. SC
o Course cr

* **PHYS 1220La / MB&B 1220La, Introduction to Physics in Living Systems: Observation and Analysis II** Staff
A hands-on introduction to the physics that enables life and human measurement of living things. This lab builds student knowledge of scientific experimental design and practice, focusing on building models from experimental data. Topics included electrical circuits, magnetism, data collection with student-built instrumentation, and quantitative assessment. For students choosing to major in MB&B, this course may be used to fulfill the MB&B requirement for Practical Skills in physics. Previously MB&B 122L. Taking MB&B/PHYS 1210L before this class is required, as the material builds on itself. Priority is given to first-year students looking to fulfill medical school application. o Course cr

* **PHYS 1230Lb and PHYS 123Lb / MB&B 1230Lb, Introduction to Physics in Living Systems III: Mechanics** Andrew Miranker
A hands-on introduction to the physics that enables life and human measurement of living things. The course focuses on the principles of mechanics at work in the biological sciences. This lab builds student knowledge, centering diffusion as an emergent phenomenon from elastic collisions, from which statistical mechanics is introduced. For students choosing to major in MB&B, this course may be used to fulfill the MB&B requirement for *Practical Skills* in physics. Priority for this 1/2 credit course is given to first-year students looking to fulfill medical school application requirements. It is helpful to take this course in the same semester as MB&B 124L. ½ Course cr per term

* **PHYS 1240Lb / MB&B 1240Lb, Introduction to Physics in Living Systems Laboratory IV: Electricity, Magnetism, and Radiation** Andrew Miranker
Introduction to the physics that enables life and human measurement of living things. This lab introduces principles of electricity, magnetism, light and optics at work in the biological sciences. The syllabus emphasizes electric dipoles as a model for

biomolecules, electric fields such as those across cell membranes, electric current, and magnetic fields. Light is developed in terms of electromagnetic radiation, ray optics and photons. The interaction of light with biomolecules to understand basic biological research and medical diagnostics are also covered. For students choosing to major in MB&B, this course may be used to fulfill the MB&B requirement for *Practical Skills* in physics. There are no prerequisites to this ½ credit class and it is helpful to take it in the same semester as MB&B 123L. May not be taken after PHYS 166L. Priority is given to first-year students looking to fulfill medical school application requirements and students seeking to join research labs at Yale. SC o Course cr

PHYS 151oa or b / APHY 151oa or b / ENAS 151oa or b, Multivariable Calculus for Engineers Staff
An introduction to multivariable calculus focusing on applications to engineering problems. Topics include vector-valued functions, vector analysis, partial differentiation, multiple integrals, vector calculus, and the theorems of Green, Stokes, and Gauss. Prerequisite: MATH 115 or equivalent. QR

PHYS 165oLa and PHYS 166oLb, General Physics Laboratory Staff
A variety of individually self-contained experiments are roughly coordinated with the lectures in PHYS 170, 171, and 180, 181 and illustrate and develop physical principles covered in those lectures. SC o Course cr per term

* **PHYS 17ooa and PHYS 171ob, University Physics for the Life Sciences** Staff
An introduction to classical physics with special emphasis on applications drawn from the life sciences and medicine. Fall-term topics include vectors and kinematics, Newton's laws, momentum, energy, random walks, diffusion, fluid mechanics, mathematical modeling, and statistical mechanics. Spring-term topics include oscillations, waves, sound, electrostatics, circuits, Maxwell's equations, electromagnetic waves, gene circuits, and quantum mechanics. Essential mathematics are introduced and explained as needed. Completion of MATH 112 or equivalent is prerequisite for PHYS 170. Completion of PHYS 170 is a prerequisite for PHYS 171. MATH 116 (or MATH 115) is recommended prior to or concurrently with PHYS 171. QR, SC o Course cr per term

PHYS 18ooa and PHYS 181ob, University Physics Staff
A broad introduction to classical and modern physics for students who have some previous preparation in physics and mathematics. Fall-term topics include Newtonian mechanics, gravitation, waves, and thermodynamics. Spring-term topics include electromagnetism, special relativity, and quantum physics. Concurrently with MATH 115 and 120 or equivalents. See comparison of introductory sequences and laboratories in the YCPS. May not be taken for credit after PHYS 170, 171. QR, SC

PHYS 2000a and PHYS 201ob, Fundamentals of Physics Staff
A thorough introduction to the principles and methods of physics for students who have good preparation in physics and mathematics. Emphasis on problem solving and quantitative reasoning. Fall-term topics include Newtonian mechanics, special relativity, gravitation, thermodynamics, and waves. Spring-term topics include electromagnetism, geometrical and physical optics, and elements of quantum mechanics. Prerequisite: MATH 115 or equivalent. MATH 120 and either MATH 225 or MATH 222, are generally taken concurrently. See comparison of introductory sequences and laboratories in the YCPS. QR, SC

PHYS 2050La or b and PHYS 2060La or b, Modern Physical Measurement Staff
A two-term sequence of experiments in classical and modern physics for students who plan to major in Physics. In the first term, the basic principles of mechanics, electricity, and magnetism are illustrated in experiments designed to make use of computer data handling and teach error analysis. In the second term, students plan and carry out experiments illustrating aspects of wave and quantum phenomena and of atomic, solid state, and nuclear physics using modern instrumentation. May be begun in either term. SC o Course cr per term

* **PHYS 2600a and PHYS 2610b, Intensive Introductory Physics** Staff
An introduction to major branches of physics—classical and relativistic mechanics; gravitation; electricity and magnetism; and quantum physics,information, and computation—at a sophisticated level. For students majoring in the physical sciences, mathematics, and philosophy whose high school training included both mechanics and electricity and magnetism at the typical college/AP level and have excellent training in, and a flair for, mathematical methods and quantitative analysis. Concurrently with MATH 120, ENAS 151, PHYS 151, or PHYS 301, or equivalent. Students considering an alternative MATH course should check with the DUS in Physics. QR, SC

* **PHYS 2710a, Independent Research in Physics** David Poland
Each student works on an independent project under the supervision of a member of the faculty or research staff. Students participate in a series of seminar meetings in which they present a talk on their project or research related to it. A written report is also required. For students with a strong background in physics coursework. This course may be taken multiple times for pass/fail credit. Suggested for first years and sophomores.

PHYS 3200a, Physics and Public Policy Barbara Cruvinel Santiago
Case studies in the science and technology enterprise in the United States and selected foreign countries focused on topics in the physical sciences; how science and technology affect public policy and in turn are affected by it; how research is planned, supported, evaluated, and utilized; how criteria for selection of research areas are developed and used in the executive and legislative branches of government. *No detailed background in physical science or mathematics required, but some basic understanding might be helpful. Physics concepts will be introduced as needed.* WR, SO

PHYS 3410b, Biological Physics Staff
An introduction to the physics of biological structures and life processes, and to the burgeoning field of biological physics. Related concepts from probability theory and statistical physics are developed as needed. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. QR, SC

PHYS 3420a / EPS 3420a, Introduction to Earth and Environmental Physics John Wettlaufer
A broad introduction to the processes that affect the past, present, and future features of the Earth. Examples include climate and climate change and anthropogenic activities underlying them, planetary history, and their relation to our understanding of Earth's present dynamics and thermodynamics. Prerequisite: PHYS 1700, 1710, or 1800, 1810, or 2000, 2010, or 2600, 2610, MATH 1200, 2460, or ENAS 1940, or permission of instructor. QR, SC

PHYS 3450b, Introduction to Quantum Information Processing and Communication Staff

This course is intended for undergraduate physics, chemistry, engineering, computer science, statistics and data science, and mathematics majors seeking an introduction to quantum information science. There is now a second quantum revolution underway and a world-wide race to build powerful new types of computers based on quantum principles, and to develop new techniques for encrypted communication whose security is guaranteed by the laws of quantum mechanics. The approach of this course to these topics will strip away much of the traditional physics details to focus on the information content of quantum systems, the nature of measurement, and why the true randomness of certain measurement results can be a feature rather than a bug. We learn what it means for a quantum bit ('qubit') to be simultaneously 0 and 1 (in some sense). We learn about quantum entanglement and the associated 'spooky action at a distance' that convinced Einstein that the quantum theory must be wrong. Ironically, this bizarre effect is now used on a daily basis to prove that quantum mechanics is indeed correct and used as a routine engineering test to make sure that quantum computers are working properly and are truly quantum. Specific topics include: the mathematical representation of quantum states as complex vectors, the superposition principle, entanglement and Bell inequalities, quantum gates and algorithms for quantum computers, quantum error correction, dense coding, teleportation, and secure quantum communication. Students learn to do problem sets based on programming and operating publicly-accessible cloud-based quantum computers. See for example: https://www.ibm.com/quantum-computing. Familiarity with complex numbers and the basics of linear algebra (matrices, determinants, eigenvectors and eigenvalues) is assumed. Prior exposure to basic probability and statistics, as well as a course in quantum mechanics are useful but not required. SC

PHYS 3530a / BENG 3500a, Introduction to Biomechanics Michael Murrell

An introduction to the biomechanics used in biosolid mechanics, biofluid mechanics, biothermomechanics, and biochemomechanics. Diverse aspects of biomedical engineering, from basic mechanobiology to the design of novel biomaterials, medical devices, and surgical interventions. Prerequisites: PHYS 180, PHYS 181, MATH 115, and ENAS 194. QR 0 Course cr

* **PHYS 3560a / ASTR 3560a / ASTR 5560a, Astrostatistics and Data Mining** Earl Bellinger

This course is intended to give students majoring in astronomy, physics, or any other physical science the necessary background to be able to conduct research with large and complex datasets. The course provides an introduction to the tools needed for analyzing large volumes of data and gives students more experience in building codes to analyze to them. The course starts with a review of basic probability and statistics. Students then learn the basics of classical statistical inference, regression and model fitting, Bayesian statistical inference, as well as different data-mining techniques. Coding with the Python programming language. Prerequisite: ASTR 255 or equivalent. QR, SC

* **PHYS 3780a, Introduction to Scientific Computing & Data Science** Daisuke Nagai

This course introduces students to essential computational and data analysis methods and tools and their problem-solving applications. These are skills and knowledge essential for beginning research in the sciences, and are not typically taught in an introductory physics curriculum. The goal here is not completeness across any of these

areas, but instead the introduction of the most important and useful skills, concepts, methods, techniques, tools and relevant knowledge for getting started in research in physics. Key learning goals include basic programming in Python, data analysis, modeling, simulations and machine learning, and their applications to problems in physics and beyond. Prerequisites: Introductory physics and familiarity with single variable calculus (basic integration, differentiation, Taylor series, etc). Previous experience in Python programming is not required. Contact instructor if you are unsure about your preparation. SC

PHYS 3930a / APHY 3930a, Einstein and the Birth of Modern Physics A Douglas Stone

The first twenty-five years of the 20th century represent a turning point in human civilization as for the first time mankind achieved a systematic and predictive understanding of the atomic level constituents of matter and energy, and the mathematical laws which describe the interaction of these constituents. In addition, the General Theory of Relativity opened up for the first time a quantitative study of cosmology, of the history of the universe as a whole. Albert Einstein was at the center of these breakthroughs, and also became an iconic figure beyond physics, representing scientist genius engaged in pure research into the fundamental laws of nature. This course addresses the nature of the transition to modern physics, underpinned by quantum and relativity theory, through study of Einstein's science, biography, and historical context. It also presents the basic concepts in electromagnetic theory, thermodynamics and statistical mechanics, special theory of relativity, and quantum mechanics which were central to this revolutionary epoch in science. Prerequisites: Two terms of PHYS 170, 171, or PHYS 180, 181, or PHYS 200, 201, or PHYS 260, 261, or one term of any of these course with permission of instructor. QR, SC

PHYS 3950a / ASTR 2550a, Research Methods in Astrophysics Marla Geha

An introduction to research methods in astronomy and astrophysics. The acquisition and analysis of astrophysical data, including the design and use of ground- and space-based telescopes, computational manipulation of digitized images and spectra, and confrontation of data with theoretical models. Examples taken from current research at Yale and elsewhere. Use of the Python programming language. Prerequisite: background in high school calculus and physics. No previous programming experience required. QR, SC RP

* **PHYS 3960b, The Impact of the Atom** Staff

Born in secrecy, the power of the atom was revealed to the world over Hiroshima in 1945. Since then, the atom has touched every facet of our lives. This seminar explores issues on how the atom has impacted the world using a multidisciplinary approach. These topics may include the impact of the atom on history, infrastructure, budget, arts and culture, peace and activism, healthcare, energy and climate change, policy, national security, international relations, science, and the future. Weekly assignments are supplemented with movie screenings and guest speakers. Prerequisites: One term of PHYS 170, 171, or PHYS 180, 181, or PHYS 200, 201, or PHYS 260, 261, or permission of instructor. SO

PHYS 4000a, Introduction to Mathematical Methods of Physics David Moore

Topics include multivariable calculus, linear algebra, complex variables, vector calculus, and differential equations. Designed to give accelerated access to 400-level courses by providing, in one term, the essential background in mathematical methods.

Recommended to be taken concurrently with PHYS 401 or 410. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. QR

PHYS 4010a and PHYS 4020b, Advanced Classical Physics from Newton to Einstein Staff
Advanced physics as the field developed from the time of Newton to the age of Einstein. Topics include mechanics, electricity and magnetism, statistical physics, and thermodynamics. The development of classical physics into a "mature" scientific discipline, an idea that was subsequently shaken to the core by the revolutionary discoveries of quantum physics and relativity. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261. Concurrently with PHYS 301 or other advanced mathematics course. QR, SC

PHYS 4100a, Classical Mechanics Yoram Alhassid
An advanced treatment of mechanics, with a focus on the methods of Lagrange and Hamilton. Lectures and problems address the mechanics of particles, systems of particles, and rigid bodies, as well as free and forced oscillations. Introduction to chaos and special relativity. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261. Concurrently with PHYS 301 or other advanced mathematics course. QR, SC

PHYS 4120b, Relativity Staff
This course covers special relativity and an introduction to general relativity. A thorough treatment of special relativity, stressing equally conceptual understanding and certain formal aspects. Introduction to general relativity covers curved spaces, Einstein's equations, and some of their solutions. Prerequisite: PHYS 401 or PHYS 410. QR, SC

PHYS 4300b, Electromagnetic Fields and Optics Staff
Electrostatics, magnetic fields of steady currents, electromagnetic waves, and relativistic dynamics. Provides a working knowledge of electrodynamics. Prerequisites: PHYS 301 and 410 or equivalents. QR, SC

PHYS 4390a / APHY 4390a, Basic Quantum Mechanics John Sous
The basic concepts and techniques of quantum mechanics essential for solid-state physics and quantum electronics. Topics include the Schrödinger treatment of the harmonic oscillator, atoms and molecules and tunneling, matrix methods, and perturbation theory. Prerequisites: PHYS 181 or 201, PHYS 301, or equivalents, or permission of instructor. QR, SC

PHYS 4400a, Quantum Mechanics and Natural Phenomena I Ramamurti Shankar
The first term of a two-term sequence covering principles of quantum mechanics with examples of applications to atomic physics. The solution of bound-state eigenvalue problems, free scattering states, barrier penetration, the hydrogen-atom problem, perturbation theory, transition amplitudes, scattering, and approximation techniques. Prerequisite: PHYS 410 or 401. QR, SC

PHYS 4410b, Quantum Mechanics and Natural Phenomena II Staff
Continuation of PHYS 440. Prerequisite: PHYS 440 and either PHYS 430 or permission of the instructor. QR, SC

PHYS 4420a, Introduction to Nuclear and Elementary Particle Physics Ian Moult
Fundamental concepts in nuclear and particle physics, including the discovery of radioactivity, the Dirac equation, antimatter, Feynman diagrams, hadron resonances, quarks and gluons, fundamental symmetries, the weak interaction, beta decay, quantum

chromodynamics, neutrino oscillation, unification, and particle theories for dark matter. Prerequisite: two term courses in quantum mechanics. QR, SC

* **PHYS 4450Lb, Advanced Physics Laboratory** Staff
Laboratory experiments with some discussion of theory and techniques. An advanced course focusing on modern experimental methods and concepts in atomic, optical, nuclear, and condensed matter physics. Intended to prepare students for independent research. For majors in the physical sciences. After or concurrently with PHYS 439 or 440, or with permission of instructor. PHYS 206L WR, SC

PHYS 4480a / APHY 4480a, Solid State Physics I Yu He
The first term of a two-term sequence covering the principles underlying the electrical, thermal, magnetic, and optical properties of solids, including crystal structure, phonons, energy bands, semiconductors, Fermi surfaces, magnetic resonances, phase transitions, dielectrics, magnetic materials, and superconductors. Prerequisites: APHY 322, 439, PHYS 420. QR, SC

PHYS 4490b / APHY 4490b, Solid State Physics II Vidvuds Ozolins
The second term of the sequence described under APHY 448. QR, SC

* **PHYS 4500a / APHY 4200a, Thermodynamics and Statistical Mechanics** Eduardo Higino da Silva Neto
This course is subdivided into two topics. We study thermodynamics from a purely macroscopic point of view and then we devote time to the study of statistical mechanics, the microscopic foundation of thermodynamics. Prerequisites: PHYS 301, 410, and 440 or permission of instructor. QR, SC

PHYS 4580a / APHY 4580a, Principles of Optics with Applications Hui Cao
Introduction to the principles of optics and electromagnetic wave phenomena with applications to microscopy, optical fibers, laser spectroscopy, and nanostructure physics. Topics include propagation of light, reflection and refraction, guiding light, polarization, interference, diffraction, scattering, Fourier optics, and optical coherence. Prerequisite: PHYS 430. QR, SC

* **PHYS 4710a, Independent Projects in Physics** David Poland
Each student works on an independent project under the supervision of a member of the faculty or research staff. Students participate in a series of seminar meetings in which they present a talk on their project or research related to it. A written report is also required. Registration is limited to junior and senior physics majors. This course may be taken up to four times for a letter grade.

Polish (PLSH)

PLSH 1100a, Elementary Polish I Krystyna Illakowicz
A comprehensive introduction to elementary Polish grammar and conversation, with emphasis on spontaneous oral expression. Reading of original texts, including poetry. Use of video materials. L1 RP 1½ Course cr

PLSH 1200b, Elementary Polish II Krystyna Illakowicz
Continuation of PLSH 110. After PLSH 110 or equivalent. L2 RP 1½ Course cr

PLSH 1300a, Intermediate Polish I Krystyna Illakowicz
A reading and conversation course conducted in Polish. Systematic review of grammar; practice in speaking and composition; reading of selected texts, including poetry. Use of video materials. After PLSH 120 or equivalent. L3 RP 1½ Course cr

PLSH 1400b, Intermediate Polish II Krystyna Illakowicz
Continuation of PLSH 130. After PLSH 130 or equivalent. L4 RP 1½ Course cr

* **PLSH 1500a, Advanced Polish** Krystyna Illakowicz
Improvement of high-level language skills through reading, comprehension, discussion, and writing. Focus on the study of language through major literary and cultural texts, as well as through film and other media. Exploration of major historical and cultural themes. Prerequisite: PLSH 140 or equivalent. L5

Political Science (PLSC)

* **PLSC 0202a, American Constitutionalism: Power and its Limits** Gordon Silverstein
What happens when a modern superpower tries to govern itself under an 18th Century Constitution? Using original documents, contemporaneous books, and U.S. Supreme Court cases, this course explores the debates that have defined America's struggle to live up to its sometimes conflicting commitments to liberty, equality and the consent of the governed. Enrollment limited to first-year students. SO

* **PLSC 0223a / ENGL 0711a, Lincoln in Thought and Action** David Bromwich
An intensive examination of the career, political thought, and speeches of Abraham Lincoln in their historical context. Enrollment limited to first-year students. WR, HU

* **PLSC 0243a / HIST 0125 / HUMS 035 / HUMS 0350a, The American Death Penalty** Lincoln Caplan
This first-year seminar focuses on the U.S. Supreme Court's 44-year experiment in regulating the American death penalty. The aims of the course are to have students learn about the workings and history of the system of capital punishment in the U.S, which is one of the most controversial elements of American criminal justice, and decide whether, in their view, the experiment is succeeding or failing—why and how. For students interested in the criminal justice system. Enrollment limited to first-year students. SO

* **PLSC 306a / CLCV 3340a / HUMS 1770a / PLSC 3369a, Tragedy and Politics** Daniel Schillinger
The canonical Greek tragedians—Aeschylus, Sophocles, and Euripides—dramatize fundamental and discomfiting questions that are often sidelined by the philosophical tradition. In this seminar, we read plays about death, war, revenge, madness, impossible choices, calamitous errors, and the destruction of whole peoples. Aeschylus, Sophocles, and Euripides were also piercing observers of political life. No less than Plato and Aristotle, the Attic tragedians write to elicit reflection on the basic patterns of politics: democracy and tyranny, war and peace, the family and the city, the rule of law and violence. Finally, we also approach Greek tragedy through its reception. Aristophanes, Plato, Aristotle, and Nietzsche: all these thinkers responded to tragedy. Texts include Aeschylus, *Oresteia;* Aristophanes, *Frogs* and *Lysistrata*; Euripides, *Bacchae*, *Heracles*, and *Trojan Women*; Nietzsche, *The Birth of Tragedy*;

Plato, *Symposium*; and Sophocles, *Antigone*, *Philoctetes*, and *Oedipus Tyrannus*. Previous work in political theory, classics, or philosophy is recommended. HU

PLSC 1222a, Introduction to American Politics Staff
Introduction to American national government. The Constitution, American political culture, civil rights, Congress, the executive, political parties, public opinion, interest groups, the media, social movements, and the policy-making process. SO o Course cr

PLSC 1327a, Introduction to Political Philosophy Staff
Fundamental issues in contemporary politics investigated through reflection on classic texts in the history of political thought. Emphasis on topics linked to modern constitutional democracies, including executive power, representation, and political parties. Readings from Plato, Machiavelli, Hobbes, Locke, Rousseau, Madison and Hamilton, Lincoln, and Tocqueville, in addition to recent articles on contemporary issues. SO o Course cr

PLSC 1413a, Comparative Politics: States, Regimes, and Conflict Staff
Introduction to the study of politics and political life in the world outside the United States. State formation and nationalism, the causes and consequences of democracy, the functioning of authoritarian regimes, social movements and collective action, and violence. SO o Course cr

PLSC 2103b / PHIL 1180b, Ethics and International Affairs Thomas Pogge
Moral reflection taken beyond state boundaries. Traditional questions about state conduct and international relations as well as more recent questions about intergovernmental agencies, nongovernmental organizations, and the design of global institutional arrangements. HU

PLSC 2105a / GLBL 2203a, Globalization and Domestic Politics Staff
This course offers students a general introduction to the political consequences of economic globalization (e.g., the rise of populist parties). We identify the winners and losers of tariff policy, foreign aid, and monetary policy (e.g., a strong/weak dollar), and examine how domestic institutions—such as lobbying and electoral systems—reinforce the advantages enjoyed by globalization's winners, while also creating opportunities for losers to advocate for policy reversal. o Course cr

PLSC 2111a, International Security Noam Reich
This course provides an overview of the study of international security in the modern era. This course has five parts. First, we begin by using the rational-choice approach to study why wars happen, how states can avoid them, and how they end. Second, there is a historical overview of major power wars. Third, we study the politics of interstate war. Fourth, we study civil wars and counterinsurgency. Finally, we study international security with a look towards the future. SO

PLSC 2127a / GLBL 2283a, Technology and War Staff
The course explores the international security implications of emerging technologies such as artificial intelligence, cyberweapons, hypersonic missiles, and so-called killer robots. The first half of the course offers a deep dive into the transformative military and civilian technologies of the 20th century, examining how doctrine and culture shaped the development, acquisition, and deployment of key systems like submarines, bomber aircraft, and nuclear bombs, and how these technologies, in turn, shaped international security. In the second half of the course, we apply the lessons of the past to make theoretically guided predictions. What norms will guide the use of

new technologies, and what weapons should or should not be developed? Are arms races inevitable? What might improve the prospects for arms control of emerging technologies? SO o Course cr

PLSC 2139a, Politics and Regimes of the Contemporary Middle East Elizabeth Parker-Magyar

Why do some autocratic governments spend decades in power while others collapse overnight? When do regime transitions lead to democratic outcomes? This course examines these questions through the lens of the 2010–11 uprisings in the Middle East and North Africa. After the initial optimism of the uprisings forced a reexamination of decades of scholarship, trajectories of regime retrenchment, conflict, and violence led to renewed interest in long-running debates on the persistence of non-democratic regimes in the region. First, looking beyond the region, this course considers debates on how to categorize political regimes and engages with theories of autocratic persistence around the globe. Moving back to the region, we trace the trajectories of different countries before and after 2010–2011. We then engage with how scholars situated the uprising within long-running debates on how historical and colonial legacies; cultural, ethnic, and religious practices and divides; contemporary patterns of foreign intervention; repression and coercion; economic resources; and contentious politics influence contemporary political outcomes in the region. SO

PLSC 2140a, Immigration Staff

This course provides an introduction to the politics of immigration focusing mostly on the challenges of integrating migrants in "host" countries, but also exploring causes of immigration as well as open questions in current immigration policy debates. We define "immigrants" and "migrants" to include people who travel across borders to resettle in other countries temporarily or permanently regardless of motive—so our definition includes both economic migrants and refugees and asylum seekers. In considering barriers to immigrant integration and ways to overcome those barriers, the course connects with theoretical perspectives across the social sciences, as well as real-life examples and experiences of immigrants, refugees, and asylum seekers as well as with the perspectives of "native" populations who must confront the challenges of accommodating migrant inflows in their countries. The course synthesizes knowledge across the fields of political science, economics, and sociology and exposes students to an inter-disciplinary perspective on immigration politics. Students are exposed to methods used to study immigration-related topics in cutting-edge research. SO o Course cr

PLSC 2253a / WGSS 2204a, Women, Politics, and Policy Staff

This course is an introduction to the way gender structures how we interpret the political world, exploring topics such as women's access to power, descriptive and substantive representation, evaluation of the functioning of political institutions, and analysis of government policy It also serves as an introduction to reading and producing empirical research on gender in the social sciences. SO o Course cr

PLSC 2255a, Special Interest Politics in the US Mellissa Meisels

This class examines how citizens and groups participate in US politics and policymaking via campaign contributions and lobbying. From elections all the way to bureaucratic policy implementation, special interests have many opportunities to attempt to pull policy closer to their preferences. Students become familiar with the regulatory environments structuring current laws regarding the revolving door and

campaign finance (e.g. Citizens United), potential avenues of participation for special interests (e.g. political donations, independent expenditures, lobbying), the goals and preferences of different types of special interests (e.g. individual donors, ideological and issue groups, public interest and identity groups, corporations, local governments), groups' organizational structures (e.g. PACs, Super PACs, "dark money" groups), and current evidence on widely-discussed reforms meant to curb the political influence of special interests. SO

PLSC 2322b / WGSS 2207b, Gender, Justice, Power, Institutions Jiya Pandya
Welcome to *Gender, Justice, Power & Institutions*, a mouthful of abstractions that we work together to comprehend and critique throughout the semester. An aspiration of this course, as political as it is pedagogic, is that students approach their world-building projects with an enriched understanding of the ways gender, justice, and power shape and are shaped by institutions, inequality, and theory. Part I opens up some preliminary considerations of our course terms by investigating the case of abortion, abortion rights, and reproductive justice. The topic is politically loaded, philosophically complex, and emotionally challenging; the point is not to convince you of the permissibility or impermissibility of abortion, but to explore how the contested case configures, imbricates, and puts pressure on our course terms. In Part II, we examine the historical and conceptual coordinates of the courses first three titular terms: is gender a subjective identification, social ascription, or axis of inequality? Is justice a matter of redistribution, recognition, resources, capabilities, or something more hedonic? Where is power located, or where does it circulate? Who are what leverages power? In Part III, we consider ways gender, justice, and power travel within and across several institutions: heterosexuality, the university, the trafficking/anti-trafficking industrial complex, the prison, and the bathroom. Part IV closes out the course by focusing on the reconfiguration of democratic institutions in late modernity; or, can institutions "love us back" under the the political economy we shorthand as "neoliberalism"? SO o Course cr

PLSC 2351a, Socialist Political Ideas Staff
This course explores the history of socialist political thought by focusing on how socialist thinkers addressed the problem of political organization and how they viewed democracy and its institutions. The course looks at Utopian socialism, the problem of political organization in 1848, Proudhon's arguments for anarchism, the economic and political thought of Karl Marx, controversies over the role of parliaments, political parties and the masses in the Second International, Lenin's theory of political action, Luxemburg's debate about imperialism and the mass strike and Gramsci's interpretation of culture. The course is structured around key primary texts, which are accompanied by secondary readings and suggestions for books and movies. None, but throughout the course, we will be referring to key historical events, which have shaped the course of socialist theorising. I will circulate a list of useful resources to help gather information about these historical moments, as well as some background readings to help students situate the thinkers in their biographical and historical context. SO o Course cr

PLSC 2363a / AFAM 1952a / SOCY 2002a, Topics in Contemporary Social Theory
Philip Gorski
In-depth introduction to recent developments in social theory, with particular emphasis on the last twenty years. Focus on three distinct areas of study: the building blocks and contrasting understandings of human persons and social action; the competing

theories of the social structure of markets, institutions, cultures, social fields, and actor-networks; and the theoretical controversies concerning nations, states and empires, ethnic and racial identity, and the relation between facts and values in social research. Authors include Judith Butler, Michel Foucault, Jurgen Habermas, Pierre Bourdieu and Bruno Latour. SOCY 151 or equivalent is strongly recommended. WR, SO o Course cr

PLSC 2417a / AFAM 1986a / LAST 1214a / SOCY 1704a, Contesting Injustice Staff
Exploration of why, when, and how people organize collectively to challenge political, social, and economic injustice. Cross-national comparison of the extent, causes, and consequences of inequality. Analysis of mobilizations for social justice in both U.S. and international settings. Intended primarily for first years and sophomores. SO o Course cr

PLSC 2427a / AFST 3381a / GLBL 2427a, Government and Politics in Africa Staff
The establishment and use of political power in selected countries of tropical Africa. The political role of ethnic and class cleavages, military coups, and the relation between politics and economic development. SO o Course cr

PLSC 2430a / LAST 1200a, Introduction to Latin American Politics Staff
Introduction to major theories of political and economic change in Latin America, and to the political and economic systems of particular countries. Questions include why the continent has been prone to unstable democratic rule, why countries in the region have adopted alternatively state-centered and market-centered economic models, and, with the most recent wave of democratization, what the remaining obstacles might be to attaining high-quality democracy. SO o Course cr

PLSC 2434a, Law & Political Development Egor Lazarev
This lecture course investigates the role of law in political development, in how political authority is constructed and contested. The central focus of the course is the political roles of legal actors—judges, prosecutors, and lawyers. The course covers state formation, the role of law in empires and colonialism, the functioning of law under authoritarian regimes and during and in the aftermath of violent political conflicts, during the transition to democracy, and in the programs of transitional justice. We analyze the role of law in the legitimation of authority, contestations for political power, and political resistance. We ask, why do some countries end up with strong and independent judiciaries while others don't? Why did some countries implement radical and comprehensive transitional justice prosecutions, while other countries chose to forget about the atrocities of the past? The class explores whether significant social and political change can be achieved through the courts. Finally, we delve into the challenges of implementing reforms in the legal field. SO o Course cr

* **PLSC 2509a / EP&E 328 / EP&E 4328a / S&DS 1720a, YData: Data Science for Political Campaigns** Joshua Kalla
Political campaigns have become increasingly data driven. Data science is used to inform where campaigns compete, which messages they use, how they deliver them, and among which voters. In this course, we explore how data science is being used to design winning campaigns. Students gain an understanding of what data is available to campaigns, how campaigns use this data to identify supporters, and the use of experiments in campaigns. This course provides students with an introduction to political campaigns, an introduction to data science tools necessary for studying

politics, and opportunities to practice the data science skills presented in S&DS 123, YData. QR

PLSC 2600a / EP&E 295 / EP&E 4295a, Game Theory and Political Science Staff
Introduction to game theory—a method by which strategic interactions among individuals and groups in society are mathematically modeled—and its applications to political science. Concepts employed by game theorists, such as Nash equilibrium, subgame perfect equilibrium, and perfect Bayesian equilibrium. Problems of cooperation, time-consistency, signaling, and reputation formation. Political applications include candidate competition, policy making, political bargaining, and international conflict. No prerequisites other than high school algebra. Political Science majors who take this course may not count ECON 159 toward the major. QR, SO
o Course cr

* **PLSC 2846a / AMST 2246a / ENGL 2826a, The Media and Democracy** Joanne Lipman
In an era of "fake news," when the media is under attack, misinformation is at epidemic levels, and new technologies are transforming the way we consume news, how do journalists hold power to account? What is the media's role in promoting and protecting democracy? Students explore topics including objectivity versus advocacy, and hate speech versus First Amendment speech protections. Case studies span from 19th century Yellow Journalism to the #MeToo and #BlackLivesMatter movements, to the rise of AI journalism and social media "news influencers." SO

* **PLSC 3104a / GLBL 3358a, The Geopolitics of Peace in Ukraine** Lauren Young
This seminar examines the war in Ukraine with a geopolitical lens focusing on its broader implications for both regional security and democracy. The outbreak of war in Ukraine in February 2022 quickly became a flashpoint in the region. Over two years later, the stakes are high and tensions are rising among transatlantic allies supporting Ukraine, both with arms and sanctions. This course evaluates the historical roots of the war and the fallout from a potential failure to effectively deter an authoritarian state from invading a sovereign neighbor. Our course of study includes the role of international stakeholders and multi-lateral institutions in the conflict, regional political and security dynamics and economic consequences. The humanitarian aspects of the war and its impact on civilian populations, human rights violations and the role of the media in shaping perceptions of the conflict is analyzed. Ultimately, what are the responsibilities of the international community in mitigating the human cost of conflict and the broader economic and policy implications? The aim of this course is both a comprehensive understanding of the conflict and its role in changing and shaping both security and democracy in region and further afield. WR, SO

* **PLSC 3107a / MMES 1121a, International Relations of the Middle East** Katherine Ingram
In this course, students develop the tools needed to understand contemporary international relations between the states of the Middle East and North Africa. The course focuses on two fundamental aspects of politics: historical context and strategic incentives. Most weeks focus on major events in a specific country or subregion, developing a historical background for that area and for how those events shaped the region more broadly. We also discuss broader topics that affect the region as a whole,

including sectarianism, oil wealth, violent non-state actors, and extraregional powers. SO

* **PLSC 3108a / GLBL 226 / SAST 3450a, National Security in India in the Twenty-first Century** Sushant Singh
This course examines the state and dynamics of national security in India in the past two decades. As an emergent power, India is an important country in Asia, with its economic and geo-political strength noticed globally. A major share of the country's heft comes from its national security paradigm which has undergone a significant shift in the twenty-first century. This course intends to take a holistic look at the conceptions for the basis of India's national security, its evolution, the current challenges and its future course by exploring its various dimensions such as China, Pakistan, global powers, Indian Ocean region, Kashmir, nuclear weapons, civil-military relations and defense preparedness. SO

* **PLSC 3118a, Political Economy of Foreign Aid** P Aronow
Introduction to modern quantitative research methods in international political economy, with a focus on empirical evidence related to foreign aid. The state of knowledge regarding the effects of development assistance on democratization, governance, human rights, and conflict. The challenges of drawing causal inferences in the domain of international political economy. SO

* **PLSC 3125a / GLBL 3344a / HIST 3783a, Studies in Grand Strategy II** Michael Brenes
The study of grand strategy, of how individuals and groups can accomplish large ends with limited means. During the fall term, students put into action the ideas studied in the spring term by applying concepts of grand strategy to present day issues. Admission is by application only; the cycle for the current year is closed. This course does not fulfill the history seminar requirement, but may count toward geographical distributional credit within the History major for any region studied, upon application to the director of undergraduate studies. Prerequisite: PLSC 321. Previous study courses in political science, history, global affairs, or subjects with broad interdisciplinary relevance encouraged. SO o Course cr

* **PLSC 3133b / EAST 4520b, Chinese Thinking on International Relations** Feng Zhang
How have the Chinese thought about international relations and their country's role in the world? How has such thinking influenced China's foreign relations past and present? This advanced seminar canvasses Chinese thinking on international relations from the imperial epoch to the present, focusing on the post-1949 era of the People's Republic of China. It is structured around three core engagements: the historical background of Chinese thinking; policy thinking of the successive PRC leaderships; and new strands of thinking at present. It examines both the evolutionary process of thinking and a body of prominent ideas and doctrines. Throughout the course, students have the opportunity to place China's foreign policy in a broader and deeper intellectual context than is often the case. SO

* **PLSC 3134a / EAST 4521a, China's International Relations** Feng Zhang
This course examines China's international relations with a focus on both historical context and contemporary developments. Beginning with imperial China's traditional foreign relations and the "century of humiliation," the course traces the evolution of

Chinese foreign policy through the Cold War period to the present day. Students analyze China's relationships with major powers and regions, including the United States, Russia, Northeast Asia, Southeast Asia, and India, while exploring critical issues such as the Taiwan question, territorial disputes in the South China Sea, and China's growing role in global governance. Special attention is paid to understanding the drivers of China's recent assertive turn in foreign policy under Xi Jinping, theories of international relations as applied to China's rise, and the implications of China's increasing power for the international order. Through engagement with scholarly works and contemporary policy debates, the course provides students with a comprehensive understanding of China's foreign relations and its emergence as a global power. SO

* **PLSC 3135a, American Foreign Policy** Staff
How does the United States make decisions in how it interacts with other states and actors in the international system? What is a foreign policy and who makes it? How do interests and different groups, institutions, and organizations inform policy decisions? What constitutes an effective foreign policy? This seminar focuses on these questions through examining the sources of U.S. foreign policy and the process of crafting and implementing policy. We analyze and evaluate the sources and execution of key foreign policy decisions in historic and contemporary case studies from the end of the Second World War to the present. Key topics of interest focus on decisions to use military force, employment of economic tools of statecraft, the role of human rights and values, managing great power competition, and U.S. relations with the Global South. By the end of the course, students should have an in-depth understanding of what has guided major American foreign policy decisions and be equipped to think about what factors will inform future policy decisions. Because this seminar seeks to bridge theory and practice, students should be comfortable with applying theoretical insights to structure analysis of major decisions and articulating policy recommendations grounded in theory and empirical evidence. SO

* **PLSC 3211a / HIST 167, Congress in the Light of History** David Mayhew
This reading and discussion class offers an overview of U.S. congressional history and politics from 1789 through today, including separation-of-powers relations with the executive branch. Topics include elections, polarization, supermajority processes, legislative productivity, and classic showdowns with the presidency. Emphasized is Congress's participation in a sequence of policymaking enterprises that have taken place from the launch of the nation through recent budget difficulties and handling of climate change. Undergrads in political science and history are the course's typical students, but anyone is welcome to apply. SO

* **PLSC 3217a / EP&E 4390a / EVST 3212a, Democracy and Sustainability** Michael Fotos
Democracy, liberty, and the sustainable use of natural resources. Concepts include institutional analysis, democratic consent, property rights, market failure, and common pool resources. Topics of policy substance are related to human use of the environment and to U.S. and global political institutions. WR, SO

* **PLSC 3220a / EVST 3255a, Environmental Law and Politics** John Wargo
We explore relations among environmental quality, health, and law. We consider global-scale *avoidable* challenges such as: environmentally related human illness, climate instability, water depletion and contamination, food and agriculture, air pollution,

energy, packaging, culinary globalization, and biodiversity loss. We evaluate the effectiveness of laws and regulations intended to reduce or prevent environmental and health damages. Additional laws considered include rights of secrecy, property, speech, worker protection, and freedom from discrimination. Comparisons among the US and EU legal standards and precautionary policies will also be examined. Ethical concerns of justice, equity, and transparency are prominent themes. SO

* **PLSC 3221a / EP&E 4306a, First Amendment and Ethics of Law** Karen Goodrow
This course addresses the First Amendment and freedom of speech, focusing on the ethical implications of restrictions on free speech, as well as the exercise of free speech. Course topics and discussions include the "fighting words" doctrine, hate speech, true threats, content regulated speech, freedom of speech and the internet, and the so-called "right to be forgotten." By the end of the course, students recognize the role free speech plays in society, including its negative and positive impacts on various segments of society. Students also have an understanding of the competing interests arising from the First Amendment's right to free speech, and can analyze how these competing interests are weighed and measured in the United States as compared with other countries. SO

* **PLSC 3224a, Cities: Making Public Choices in New Haven** John DeStefano
Examination of cities, particularly the relationship of people to place and most importantly to one another, through the prism and experiences of the City of New Haven. Exploration of how concepts of social capital and legitimacy of institutions in policy design and execution, are key to the well being of community residents. How cities, in the context of retreating or antagonistic strategies by the state and federal governments, can be key platforms for future economic and social wealth creation. SO

* **PLSC 3233a / EDST 2238a / EDST 238, The Politics of Public Education** Staff
Examination of the deep political divides, past and present, over public education in the United States. Fundamental questions, including who gets to determine where and how children are educated, who should pay for public education, and the role of education as a counter for poverty, remain politically contested. The course explores these conflicts from a variety of political perspectives. Students learn journalistic methods, including narrative, opinion and digital storytelling, developing the necessary skills to participate in the national conversation around education policy and politics. WR, SO

* **PLSC 3238a / AMST 4469a / EP&E 4396a, American Progressivism and Its Critics** Stephen Skowronek
The progressive reform tradition in American politics. The tradition's conceptual underpinnings, social supports, practical manifestations in policy and in new governmental arrangements, and conservative critics. Emphasis on the origins of progressivism in the early decades of the twentieth century, with attention to latter-day manifestations and to changes in the progressive impulse over time. SO

* **PLSC 3251a / EDST 2232a, US Federal Education Policy** Eleanor Schiff
Though education policy is typically viewed as a state and local issue, the federal government has taken a significant role in shaping policy since the end of World War II. The centralization of education policy has corresponded with changing views in society for what constitutes an equitable educational opportunity. This class is divided into three topics: 1) the federal role in education broadly (K-12) and the accountability

movement in K-12: from the No Child Left Behind Act to the Common Core State Standards (and cross-national comparisons to US schools), 2) federal role in higher education, and 3) the education industry (teachers unions and think tanks). EDST 1110 recommended. SO

* **PLSC 3254a, Strategy Across Sectors: Business, Nonprofit, and Government** Chad Losee
How do leaders guide organizations toward success in a world of finite resources, competing interests, and constant change? This course explores the fundamental principles of strategy in business, nonprofits, and government, examining how organizations set objectives, allocate their unique assets, and navigate both market and non-market forces. Using the case method, we analyze real-world strategic dilemmas, considering not only economic competition but also the broader political, regulatory, and societal factors that shape strategic choices. For the final paper, you'll apply these concepts to Yale itself, evaluating an aspect of the university's current strategic position and recommending how it can thrive in an evolving higher education landscape.

* **PLSC 3301a, Advanced Topics in Modern Political Philosophy** Giulia Oskian
This seminar explores key concepts in modern political philosophy. This term our thematic focus is on the relation between civil society and state institutions, as it has been conceptualized by political philosophy. Prerequisite: substantial course work in intellectual history and/or political theory. Appropriate for graduate students preparing for the political theory field exam. HU, SO

* **PLSC 3313a / HIST 3292a / HUMS 2790a, Democracy and the French Revolution** Isaac Nakhimovsky
The French Revolution of 1789 and its legacies, as viewed through the late-eighteenth-century debates about democracy, equality, representative government, and historical change that shaped an enduring agenda for historical and political thought in Europe and around the world. WR, HU

* **PLSC 3324a / PHIL 4464a, Justice, Taxes, and Global Financial Integrity** Thomas Pogge
Study of the formulation, interpretation, and enforcement of national and international tax rules from the perspective of national and global economic justice. Prerequisites: previous courses in one or two of the following: law, economics, political science, or political philosophy. HU

* **PLSC 3339a / EP&E 4246a, Participatory Democracy** Amir Fairdosi
What does democracy look like without elections? In this class, we discuss the theory and practice of "participatory" forms of democracy (i.e. those that allow and encourage citizens to influence policy directly, rather than indirectly through elected representatives). SO

* **PLSC 3345a, Radical Classics** Mordechai Levy-Eichel
This course dives into the political, intellectual, and social thought and criticism of the late 19th and early 20th century Anglo-American world. Questions posed will include: what is culture? What is religion? What is work? What is leisure? What should one read? How does learn to do good? What is fulfillment? What is happiness, and what is health (and what if the two are not the same)? What does it mean to be divided? And how should one even pose these questions in the first place? Readings include Matthew Arnold, W. E. B. DuBois, William James, and Thorstein Veblen. SO

* **PLSC 3346b / EP&E 4235b / PHIL 4457b, Recent Work on Justice** Thomas Pogge
In-depth study of one contemporary book, author, or debate in political philosophy, political theory, or normative economics. Focus varies from year to year based on student interest and may include a ground-breaking new book, the life's work of a prominent author, or an important theme in contemporary political thought. HU

* **PLSC 3356a, The Politics of Expertise** Federico Brandmayr
Few societies have been as reliant on experts as our own. As societies grow more complex and technology advances, so does the need for experts who have undergone years of specialized training. Ordinary citizens, firms, state bureaucracies, courts, and legislators constantly rely on experts to guide them in their decisions. However, this reliance is far from seamless. Opportunities to become a successful expert are uneven and often depend on circumstances beyond individual control. Specialists must counter public skepticism and compete with rival groups to establish their authority. Decision-makers are inundated with claims of expertise, making it challenging to discern between valid and dubious advice. Experts can exacerbate issues, fail catastrophically, or neglect public concerns to serve their own interests. Moreover, the increasingly specialized knowledge possessed by experts can seem esoteric and detached from everyday life, leading laypeople to view them with suspicion. For these reasons and others, the very notion of expertise has become highly politicized in recent years. Our society seems to be more and more divided between those who think that experts are indispensable to solve our problems, and those who see them as the root of our troubles. The course adopts an interdisciplinary perspective to explore these issues, drawing from both classical and modern research in sociology, political science, psychology, and philosophy. SO

* **PLSC 3369a / CLCV 3340a / HUMS 1770a / PLSC 306a, Tragedy and Politics** Daniel Schillinger
The canonical Greek tragedians—Aeschylus, Sophocles, and Euripides—dramatize fundamental and discomfiting questions that are often sidelined by the philosophical tradition. In this seminar, we read plays about death, war, revenge, madness, impossible choices, calamitous errors, and the destruction of whole peoples. Aeschylus, Sophocles, and Euripides were also piercing observers of political life. No less than Plato and Aristotle, the Attic tragedians write to elicit reflection on the basic patterns of politics: democracy and tyranny, war and peace, the family and the city, the rule of law and violence. Finally, we also approach Greek tragedy through its reception. Aristophanes, Plato, Aristotle, and Nietzsche: all these thinkers responded to tragedy. Texts include Aeschylus, *Oresteia;* Aristophanes, *Frogs* and *Lysistrata*; Euripides, *Bacchae*, *Heracles*, and *Trojan Women*; Nietzsche, *The Birth of Tragedy*; Plato, *Symposium*; and Sophocles, *Antigone*, *Philoctetes*, and *Oedipus Tyrannus*. Previous work in political theory, classics, or philosophy is recommended. HU

* **PLSC 3371a / HUMS 3371a / PHIL 3371a, Machiavelli and Machiavellianism** Steven Smith
It is generally agreed that modern political science begins with Machiavelli, but what that means remains a subject of considerable dispute. What were Machiavelli's accomplishments? Was he a political realist who taught us to seek for "the effectual truth" of things? Was he an advisor to princes or, at the very least, powerful executives who taught the importance of acting by "oneself alone"? Was he a populist who sought to reanimate a taste for Roman-style republicanism? Or did he seek to bring about

a new kind of expansive territorial state fuelled by war and the desire for empire? Machiavelli's influence has been widespread throughout the modern world. But just because his writings have been used and misused for a range of causes does not mean that we cannot discover an intelligible and coherent core to his work. We read Machiavelli's two most important works of political theory—the *Prince* and the *Discourses on Livy*. The latter is read along with the Roman historian Titus Livy who was Machiavelli's major source for his theories of political conflict, leadership, and liberty. We then consider his influence on some selected nineteenth and twentieth-century political theorists who have appropriated him as the central figure of modernity. Throughout the course we are attentive to the interpretive and methodological issues at stake in the recovery of the thought of this great Florentine political thinker. SO

* **PLSC 3372a / EDST 1372a / HUMS 3372a, Idolizing Education** Mordechai Levy-Eichel

What is learning? What is education? And why is it so easy to ask, yet so damn hard to answer these questions? Is there something wrong with these queries, with the assumptions we have about them—and what assumptions are those, anyways? This course will be an examination of the history, sociology, politics, and philosophy of education, as well as a critical examination of the scholarly study of education. Although there has probably never been more research into learning and schools, our presuppositions about what education should be have, in fact, narrowed and hardened. This course aims both to break and to refresh them. Examples will range chronologically from ancient to modern times, and will be taken from a broad range of traditions and institutions. Particular attention will be paid to the origins and growth of the research university, and the costs and benefits involved in the modern institutionalization of learning. We will focus on—in the words of a noted, but now neglected Yale psychologist (Seymour Sarason)—how education has, especially in modern western societies like ours, become both "scapegoat and salvation."

* **PLSC 3410a, Comparative Constitutionalism and Legal Institutions** Steven Calabresi

Introduction to the field of comparative constitutional law. Constitutional texts, materials, and cases drawn primarily from those constitutional democracies that are also members of the Group of Twenty Nations and that respect judicial independence. SO

* **PLSC 3411a / EDST 1282a, Comparative International Education** Mira Debs

Around the world, education is one of the central institutions of society, developing the next generation of citizens, workers and individuals. How do countries balance these competing priorities? In which ways do countries converge on policies, or develop novel approaches to education? Through the course, students learn the a) impact of colonialism on contemporary education systems, b) the competing tensions of the demands of citizen and worker and c) how a variety of educational policies are impacted around the world and their impact on diverse populations of students. EDST 1110 recommended. WR, SO

* **PLSC 3418a, Democratic Backsliding** Milan Svolik

This class examines the process of democratic backsliding, including its causes, and consequences. Our analysis builds on prominent contemporary and historical cases of democratic backsliding, especially Hungary, India, Poland, Russia, and Venezuela. Implications for democratic stability in the United States is considered. SO

* **PLSC 3439a / AFST 3385a / EP&E 4350a / HIST 2391a / HIST 3344a, Pandemics in Africa: From the Spanish Influenza to Covid-19** Jonny Steinberg
The overarching aim of the course is to understand the unfolding Covid-19 pandemic in Africa in the context of a century of pandemics, their political and administrative management, the responses of ordinary people, and the lasting changes they wrought. The first eight meetings examine some of the best social science-literature on 20th-century African pandemics before Covid-19. From the Spanish Influenza to cholera to AIDS, to the misdiagnosis of yaws as syphilis, and tuberculosis as hereditary, the social-science literature can be assembled to ask a host of vital questions in political theory: on the limits of coercion, on the connection between political power and scientific expertise, between pandemic disease and political legitimacy, and pervasively, across all modern African epidemics, between infection and the politics of race. The remaining four meetings look at Covid-19. We chronicle the evolving responses of policymakers, scholars, religious leaders, opposition figures, and, to the extent that we can, ordinary people. The idea is to assemble sufficient information to facilitate a real-time study of thinking and deciding in times of radical uncertainty and to examine, too, the consequences of decisions on the course of events. There are of course so many moving parts: health systems, international political economy, finance, policing, and more. We also bring guests into the classroom, among them frontline actors in the current pandemic as well as veterans of previous pandemics well placed to share provisional comparative thinking. This last dimension is especially emphasized: the current period, studied in the light of a century of epidemic disease, affording us the opportunity to see path dependencies and novelties, the old and the new. SO

* **PLSC 3456a / GLBL 4405a, Self-Determination, Secession & Accommodation** Maria Jose Hierro
This seminar offers specialized instruction on self-determination and secession, combining insights from scholarly research with in-depth case study analysis to explore the complexity of contemporary secessionist conflicts. We focus on two key multinational states: Spain—an advanced Western democracy—examined through Catalonia's independence movement, and India—an influential Global South country—through the case of Tamil Nadu. The course also engages with other high-profile cases, such as Greenland, Somaliland, and Republika Srpska, paying particular attention to the role and strategic interests of the United States in shaping international responses and influencing the trajectory of these conflicts. Students should have taken at least one Comparative Politics and/or International Relations introductory course. SO

* **PLSC 3457a / AFST 4406a / GLBL 3363a, Sexual Violence and War** Elisabeth Wood
Analysis of patterns of sexual violence in war. Assessment of how well scholars in various disciplines and policy analysts account for these patterns. SO

* **PLSC 3462a / EP&E 4250a, The European Union** David Cameron
Origins and development of the European Community and Union over the past fifty years; ways in which the often-conflicting ambitions of its member states have shaped the EU; relations between member states and the EU's supranational institutions and politics; and economic, political, and geopolitical challenges. SO

* **PLSC 3464a / HIST 3768a / JDST 3451a / RLST 3240a, The Global Right: From the French Revolution to the American Insurrection** Elli Stern
This seminar explores the history of right-wing political thought from the late eighteenth century to the present, with an emphasis on the role played by religious

and pagan traditions. This course seeks to answer the question, what constitutes the right? What are the central philosophical, religious, and pagan, principles of those groups associated with this designation? How have the core ideas of the right changed over time? We do this by examining primary tracts written by theologians, political philosophers, and social theorists as well as secondary literature written by scholars interrogating movements associated with the right in America, Europe, Middle East and Asia. Though touching on specific national political parties, institutions, and think tanks, its focus is on mapping the intellectual overlap and differences between various right-wing ideologies. While the course is limited to the modern period, it adopts a global perspective to better understand the full scope of right-wing politics. HU, SO

* **PLSC 3502a, Design-Based Inference for the Social Sciences** P Aronow
Introduction to design-based statistical approaches to survey sampling and causal inference. Design and analysis of complex survey samples and randomized experiments, including model-assisted approaches. Discussion of recent advances in this paradigm, including inference in network settings. Prerequisite: Probability theory at the level of S&DS 241, PLSC 500 or ECON 135. QR, SO

PLSC 3508a or b / CPSC 1230a or b / S&DS 1230a or b / S&DS 5230a or b, YData: An Introduction to Data Science Staff
Computational, programming, and statistical skills are no longer optional in our increasingly data-driven world; these skills are essential for opening doors to manifold research and career opportunities. This course aims to dramatically enhance knowledge and capabilities in fundamental ideas and skills in data science, especially computational and programming skills along with inferential thinking. YData is an introduction to Data Science that emphasizes the development of these skills while providing opportunities for hands-on experience and practice. YData is accessible to students with little or no background in computing, programming, or statistics, but is also engaging for more technically oriented students through extensive use of examples and hands-on data analysis. Python 3, a popular and widely used computing language, is the language used in this course. The computing materials will be hosted on a special purpose web server. QR

* **PLSC 3511a / SOCY 3203a, AI for Social Science Methods** Daniel Karell
Social scientists have begun integrating AI technology into the designs and methods of their research projects. How are they doing so? What are the current standards and best practices? This course uses a seminar format to review, discuss, and critique how AI technologies are currently being incorporated into social science research activities. Students read recently published articles and widely discussed unpublished papers, and, through class discussion, identify the promises and pitfalls of using AI to conduct social science research. Students also learn how to justify and explain the use of AI in their own research projects. Prerequisite: The required methods courses in Sociology or Political Science. SO

* **PLSC 4203a, Political Preferences and American Political Behavior** Joshua Kalla
Introduction to research methods and topics in American political behavior. Focus on decision making from the perspective of ordinary citizens. Topics include utility theory, heuristics and biases, political participation, retrospective voting, the consequences of political ignorance, the effects of campaigns, and the ability of voters to hold politicians accountable for their actions. SO

* **PLSC 4507a, Applied Quantitative Research Design** Shiro Kuriwaki
Research designs are strategies to obtain empirical answers to theoretical questions. This class trains students with the best practices for implementing and communicating rigorous quantitative social science research. We cover econometrics techniques of causal inference, prediction, and missing data. These include fixed effects, time series, instrumental variables, survey weighting, and shrinkage. This is a hands-on, application-oriented class. Students will practice programming, statistics, and data visualizations used in exemplary quantitative social science articles. Formal section enrollment is not required but highly encouraged. Prerequisite: Any statistics or data science course that teaches ordinary least squares regression and p-values, such as S&DS 230. Some past or concurrent experience with a programming language such as R is also presumed. Ph.D. students in political science can join without prerequisite.
QR, SO o Course cr

* **PLSC 4700a and PLSC 4701a, Individual Reading for Majors** Andrea Aldrich
Special reading courses may be established with individual members of the department. They must satisfy the following conditions: (1) a prospectus describing the nature of the program and the readings to be covered must be approved by both the instructor and the director of undergraduate studies; (2) the student must meet regularly with the instructor for an average of at least two hours per week; (3) the course must include a term essay, several short essays, or a final examination; (4) the topic and/or content must not be substantially encompassed by an existing undergraduate or graduate course. All coursework must be submitted no later than the last day of reading period.

* **PLSC 4900a, The Senior Colloquium** Maria Jose Hierro
Presentation and discussion of students' research proposals, with particular attention to choice of topic and research design. Each student frames the structure of the essay, chooses research methods, begins the research, and presents and discusses a draft of the introductory section of the essay. Enrollment limited to Political Science majors.

* **PLSC 4901a, Yearlong Senior Essay (II)** Andrea Aldrich
Each student writing a yearlong senior essay establishes a regular consultation schedule with a department member who, working from the prospectus prepared for PLSC 4900, advises the student about preparation of the essay and changes to successive drafts. After PLSC 4900. Enrollment limited to Political Science majors writing a yearlong senior essay.

* **PLSC 4903a, Senior Essay (III) for Intensive Majors** Andrea Aldrich
Each student in the intensive major establishes a regular consultation schedule with a department member who, working from the prospectus prepared for PLSC 4900, advises the student about preparation of the essay and changes to successive drafts, as well as reporting the student's progress until submission of the final essay. Enrollment limited to Political Science intensive majors.

Portuguese (PORT)

PORT 1100a, Elementary Portuguese I Staff
This course introduces the Portuguese language through a comprehensive exploration of cultural topics from the Lusophone world. Instead of traditional textbooks, students engage with diverse authentic materials to enhance learning. Organized into three content units, students reflect on themes related to urban life, addressing

guiding questions such as "Who are you in the city?" and "What Do You See from Your Window?" Through visual arts, music, film, and various literary genres, students explore these topics through paced activities focusing on comprehension, contextualization, reflection, and the creation of new meaning. They discuss and interpret challenging themes such as racism, neoliberalism, and sexism from minority perspectives, starting from the first semester of Portuguese studies. Each unit concludes with a small project, integrating knowledge with other university courses. By the course end, students will have gained an understanding of the language across textual genres focusing on diverse aspects of Portuguese-speaking cultures. Students can also publish their work in our digital magazine, Revista dos Estudantes de Português da Yale. L1 1½ Course cr

PORT 1300a, Intermediate Portuguese I Staff
This course, a continuation of Portuguese 120, enhances Portuguese language skills by exploring cultural topics of the Lusophone world. It consists of three units: the intersection of iconic and minority-produced art, including street art and Afro-Lusophone cultural production; the impact of fake news in contemporary society; and Indigenous cosmovisions and their role in postponing global crises. In this course, students do not find traditional textbooks. Instead, each unit employs authentic materials across various genres—visual arts, articles, music, poetry, videos, films, plays, and essays—for comprehension, contextualization, reflection, and meaning creation. Through this approach, students not only learn Portuguese as a language but also delve into critical contexts that deepen their understanding of language usage and reveal aspects of their own culture they may not have previously considered. Units culminate in small projects where students, individually and in groups, create diverse media, scripts, and texts. Themes include gender, class, ethnicity, Black feminism, and ecological crises viewed through Indigenous perspectives. By course end, students can grasp diverse cultural aspects in a global context, refining their Portuguese language skills. Students also have the option to publish their work in our digital magazine, Revista dos Estudantes de Português da Yale. L3 1½ Course cr

PORT 1440a, Portuguese for Romance Language Speakers II Giseli Tordin
This course is designed for advanced students of Romance languages or heritage speakers of Portuguese. It follows a content and project-based learning approach. The course examines a variety of perspectives on the environment and cities, featuring Indigenous art and film, essays on the Amazon, and the works of women photographers, filmmakers, and authors. Students explore how we can decolonize our viewpoints by revisiting the past and reimagining the future. Instead of traditional textbooks, students analyze authentic materials, such as newspaper articles, short novels, essays, media, and academic texts that address contemporary political, social, and environmental issues. Through compelling themes, author interviews, and cultural topics, students deepen their language skills while critically examining social issues. Students refine their Portuguese through multimodal texts and projects, with an opportunity to submit their work for publication in the *Yale Portuguese Students' Digital Magazine*. Prerequisites from two of these three options: (1)SPAN 1400 or 1450, FREN 1400 or 1450, ITAL 1400 or 1450, or higher; a satisfactory placement test score; heritage speakers of Romance languages; (2) PORT 1240; (3) Instructor Permission. L3, L4 1½ Course cr

PORT 2165a / FILM 2167a / LAST 2165a / SPAN 2090a / WGSS 2165a, Through the Lens of Memory: Other Perspectives on Dictatorships in Latin America and Iberia Giseli Tordin

This course examines the cinematic portrayals of military dictatorships in Brazil, Argentina, Chile, Spain, and Portugal, exploring how film serves as both a historical document and a means to reinterpret and reconstruct the past. As a language course, it allows students to engage with multiple modes of meaning—linguistic, visual, auditory, tactile, gestural, and spatial—through which cinema conveys its narratives. Students analyze how films reconstruct memory, challenge hegemonic historiography, and reinscribe erased or silenced perspectives. The course reflects on the relevance of these works in contemporary struggles against violence and oppression, considering how they teach us to critically engage with power, resistance, and collective memory. It also focuses on women's cinematic productions and representations, examining how gender, race, and political resistance intersect in the visual representation of repression, violence, and memory. The course incorporates both Spanish and Portuguese, encouraging students to express their ideas and develop projects in either language. Languages: Portuguese and Spanish. Prerequisite: PORT 1400 (or equivalent) or SPAN 1400 (or equivalent). L5, HU

PORT 2170a / AFST 2170a / ER&M 2568a / LAST 1170a, A Luta Continua: African, Asian, and Indigenous Responses to Coloniality in the Lusophone World Kevin Ennis

What did it mean to be anticolonial in the era of revolution against the Portuguese Empire, and what does it mean today in the twenty-first century across the Portuguese-speaking world? In this course we examine the reverberations of anticolonial movements in Portuguese-speaking African and Asian territories, as well as in Indigenous movements in Brazil. Focusing on political, social, and cultural dimensions of emancipation, we ask: How have African, Asian, and Indigenous writers and artists imagined emancipatory endeavors for their peoples, their countries, and their worlds? What is the role of cultural expression in world-sharing and world-building in response to centuries of colonialism and its legacies? This course also aims to further develop communicative proficiency in Portuguese and enhance knowledge of the diverse cultures of the Portuguese-speaking world. Prerequisite: PORT 140, or equivalent in placement. L5, HU

* **PORT 3230a / CPLT 3565a / SPAN 3565a / TDPS 3051a, Staging Early Iberian Drama** Nicholas Jones

This course examines the construction and representation of class, gender, power, race, and sexuality in early Iberian drama. Taking a chronological frame, we cover these themes beginning with medieval Iberian pageantry and ending with the works of Pedro Calderón de la Barca and Sor Juana Inés de la Cruz. To guide and nuance our class discussions and readings, we interrogate the staging and performance of class, gender, race, and sexuality along the lines of: courtly and civic coronations, pageantry, and tournaments; the Renaissance underworld of *La Celestina*; the short-skit interludes of Lope de Rueda; Lope de Vega and the *comedia nueva*; African dances and blackface performance; cross-dressing and gender dissidence in Tirso de Molina and Sor Juana; queer readings of Agustín Moreto's *El lindo Don Diego*; celebrity and the stardom of actors; clothing, cosmetics, and stage props; and, architecture, urban space and cities. L5, HU

* **PORT 3520a / CPLT 2560a / CPLT 6570a / PORT 6520a, Clarice Lispector: The Short Stories** Kenneth David Jackson
This course is a seminar on the complete short stories of Clarice Lispector (1920–1977), a master of the genre and one of the major authors of twentieth-century Brazil known for existentialism, mysticism and feminism. WR, HU

* **PORT 3530a / CPLT 2900a, Machado de Assis: Major Novels** Kenneth David Jackson
A study of the last five novels of Machado de Assis, featuring the author's world and stage of Rio de Janeiro, along with his irony and skepticism, satire, wit, narrative concision, social critiques, and encyclopedic assimilation of world literature. WR, HU

* **PORT 4710a, Directed Reading or Directed Research** Kenneth David Jackson
Individual study for qualified students under the supervision of a faculty member selected by the student. Approval of the director of undergraduate studies is required.

* **PORT 4910a, The Senior Essay** Kenneth David Jackson
A research project designed under a faculty director, resulting in a substantial paper written in Portuguese, submitted to the DUS and a second designated reader.

Psychology (PSYC)

PSYC 116b / CGSC 2160b / CGSC 216b and CGSC 2160b / LING 1160b / PSYC 1316b, Cognitive Science of Language Athulya Aravind
The study of language from the perspective of cognitive science. Exploration of mental structures that underlie the human ability to learn and process language, drawing on studies of normal and atypical language development and processing, brain imaging, neuropsychology, and computational modeling. Innate linguistic structure vs. determination by experience and culture; the relation between linguistic and nonlinguistic cognition in the domains of decision making, social cognition, and musical cognition; the degree to which language shapes perceptions of color, number, space, and gender. SO

PSYC 1100a or b, Introduction to Psychology Staff
A survey of major psychological approaches to the biological, cognitive, and social bases of behavior. SO

PSYC 1300a / CGSC 1100a / PSYC 130, Introduction to Cognitive Science Brian Scholl
An introduction to the interdisciplinary study of how the mind works. Discussion of tools, theories, and assumptions from psychology, computer science, neuroscience, linguistics, and philosophy. SO

PSYC 1316b / CGSC 2160b / CGSC 216b and CGSC 2160b / LING 1160b / PSYC 116b, Cognitive Science of Language Athulya Aravind
The study of language from the perspective of cognitive science. Exploration of mental structures that underlie the human ability to learn and process language, drawing on studies of normal and atypical language development and processing, brain imaging, neuropsychology, and computational modeling. Innate linguistic structure vs. determination by experience and culture; the relation between linguistic and nonlinguistic cognition in the domains of decision making, social cognition, and

musical cognition; the degree to which language shapes perceptions of color, number, space, and gender. SO

PSYC 1382a / CGSC 2820a / PHIL 1182a, Perspectives on Human Nature Staff
Comparison of philosophical and psychological perspectives on human nature. Nietzsche on morality, paired with contemporary work on the psychology of moral judgment; Marx on religion, paired with systematic research on the science of religious belief; Schopenhauer paired with social psychology on happiness. HU 0 Course cr

PSYC 1390b / CGSC 1390b, Mental Lives of Babies and Animals Nicolò Cesana-Arlotti
Interdisciplinary exploration of the cognitive, social, and emotional capacities of creatures lacking language and culture. The extent to which our complex psychology is unique to mature humans; the relative richness of a mental life without language or culture. Some attention to particular human populations such as children with autism and adults with language disorders. SO

PSYC 1400a / EDST 1140 / EDST 140, Developmental Psychology Julia Leonard
An introduction to research and theory on the development of perception, action, emotion, personality, language, and cognition from a cognitive science perspective. Focus on birth to adolescence in humans and other species. Prerequisite: PSYC 110. SO

* **PSYC 1425a / CHLD 1250a / EDST 1125a / PSYC 125, Child Development** Ann Close and Carla Horwitz
This course is first in a sequence including Theory and Practice of Early Childhood Education (CHLD127/PSYCH 127/EDST 127) and Language Literacy and Play (CHLD 128/PSYCH 128/EDST 128). This course provides students a theoretical base in child development and behavior and tools to sensitively and carefully observer infants and young children. The seminar will consider aspects of cognitive, social, and emotional development. An assumption of this course is that it is not possible to understand children—their behavior and development—without understanding their families and culture and the relationships between children and parents. The course will give an overview of the major theories in the field, focusing on the complex interaction between the developing self and the environment, exploring current research and theory as well as practice. Students will have the opportunity to see how programs for young children use psychodynamic and interactional theories to inform the development of their philosophy and curriculum. Weekly Observations:-Total Time Commitment 3 hours per week. Students will do two separate weekly observations over the course of the semester. They will observe in a group setting for 2 hours each each week at a Yale affiliated child care center. Students will also arrange to do a weekly 1 hour observation (either in person or virtually) of a child under the age of 6. Students must make their own arrangements for these individual observations. If it is not possible to arrange a child to observe, please do not apply to take this course. For a portion of class meetings, the class will divide into small supervisory discussion groups. Priority given to juniors, seniors, Ed Study students. WR, SO

* **PSYC 1427b / CHLD 1270b / EDST 3127b, Theory and Practice of Early Childhood Education** Carla Horwitz
The course deals with development and delivery of curricula for **young children ages 3–6** and the current context of educational reform and debate. Goals are to deepen insights through critical analysis of educational programs for young children in light

of current research and developmental theory and to understand how culture and political context contribute to the practice of education. Regularly scheduled seminar discussions and workshops that engage students with learning materials emphasize the ongoing dynamic process of developing emergent curriculum and focus on methods of creating a responsive, inclusive environment; planning and assessment; appreciating cultural and linguistic diversity; teachers' roles; anti-bias education; working with families; conceptualizing the professional challenges of collaborating on a teaching team within the organization of the school; standards and accountability and the role of policy and advocacy in educational change. The course will use newspaper and magazine articles and other recent media as primary sources in addition to current research and other texts. Students must arrange to do a weekly one-hour observation (in-person or virtually) of a child under age 6 and an additional 2 hour in-person classroom observation at Calvin Hill Day Care Center or another Yale-affiliated child care center. Total observation time commitment is 3 hours per week. If you are unable to find a child to observe, please do not register for this class. CHLD 125 is recommended. Permission of instructor is required. Priority given to juniors, seniors, and Ed Study students. WR, SO RP

* **PSYC 1428b / CHLD 1280b / EDST 3128b, Language, Literacy, and Play** Ann Close and Carla Horwitz

The focus of this course will be to demonstrate the complicated role that play has in the development of language and literacy skills. A major part of each topic presentation will be a discussion of the role that play has in the curriculum in enhancing these developmental areas. There is a widespread consensus that play is an essential component of a developmentally appropriate early childhood curriculum. Research indicates that play enhances a child's creativity, intellectual development and social emotional development. Because learning to play, learning language and learning literacy skills are all part of the process of thinking and communication, the course will provide a view which attempts to demonstrate the integration of language, literacy and play in an early childhood education curriculum. Theoretical aspects of each of these developmental areas will be examined first, and it will be that theoretical understanding which will be the basis upon which ideas about curriculum will be explored, experienced and discussed. Students must arrange to do a weekly one-hour observation (in-person or virtually) of a child under age 6 and an additional 2 hour in-person classroom observation at Calvin Hill Day Care Center or another Yale-affiliated child care center. Total observation time commitment is 3 hours per week. If you are unable to find a child to observe, please do not register for this class. Permission of instructor. Enrollment priority will be given to juniors, seniors, and Education Studies Certificate students. WR, SO RP

PSYC 1500b / EDST 1160b, Social Psychology Maria Gendron

Theories, methodology, and applications of social psychology. Core topics include the self, social cognition/social perception, attitudes and persuasion, group processes, conformity, human conflict and aggression, prejudice, prosocial behavior, and emotion. SO

PSYC 1600a / NSCI 160 / NSCI 1600a / PSYC 160, The Human Brain Robb Rutledge

Introduction to the neural bases of human psychological function, including social, cognitive, and affective processing. Preparation for more advanced courses in cognitive

and social neuroscience. Topics include memory, reward processing, neuroeconomics, individual differences, emotion, social inferences, and clinical disorders. Neuroanatomy, neurophysiology, and neuropharmacology are also introduced. SC

PSYC 1700a or b / EDST 1180a or b / EDST 180, Clinical Psychology Staff
The major forms of psychopathology that appear in childhood and adult life. Topics include the symptomatology of mental disorders; their etiology from psychological, biological, and sociocultural perspectives; and issues pertaining to diagnosis and treatment. SO o Course cr

PSYC 2200a or b, Research Methods, Writing Intensive Staff
Introduction to general principles and strategies of psychological research. Topics include generating and testing hypotheses, laboratory and field experiments, scale construction, sampling, archival methods, case studies, ethics and politics of research, and Internet and cross-cultural methods. Hands-on research experience in laboratories. Prerequisite: PSYC 200 or S&DS 103. WR, SO

* **PSYC 2600b / NSCI 2400b, Research Methods in Human Neuroscience** Gregory McCarthy
Primary focus on structural, functional, and diffusion magnetic resonance imaging, with a secondary emphasis upon brain stimulation, electroencephalography, and evoked potentials. Students learn the fundamentals of each method and the experimental designs for which they are most applicable. Prerequisites: PSYC 160/NSCI 160 and a course in statistics, or permission of instructor. SC

PSYC 2610a / CGSC 274 / CGSC 2740a / NSCI 3610a, Algorithms of the Mind Ilker Yildirim
This course introduces computational theories of psychological processes, with a pedagogical focus on perception and high-level cognition. Each week students learn about new computational methods grounded in neurocognitive phenomena. Lectures introduce these topics conceptually; lab sections provide hands-on instruction with programming assignments and review of mathematical concepts. Lectures cover a range of computational methods sampling across the fields of computational statistics, artificial intelligence and machine learning, including probabilistic programming, neural networks, and differentiable programming. Students must have a fairly strong programming background, ideally in a high-level programming language such as Julia, Python or C++. (The course will use Julia and Python substantially). Familiarity with bash scripting and HPC use are desirable. College-level calculus is required, in addition to some exposure to probability and Bayesian inference, or more broadly (probabilistic) machine learning. QR, SC, SO o Course cr

* **PSYC 2670a / NSCI 270 / NSCI 2700a, Research Methods in Cognitive Neuroscience** Stephanie Lazzaro
This course introduces methods used by cognitive neuroscientists to discover the structural and functional features of the nervous system. A combination of lectures and hands-on lab activities help students understand the structure and function of the human brain. WR, SC

* **PSYC 2760a / NSCI 2600a, Research Methods in Psychopathology: Psychotic Disorders** Tyrone Cannon
Methods of research in psychopathology. Focus on longitudinal designs, high-risk sampling approaches, prediction of outcomes, and modeling change over time.

Students design and perform analyses of clinical, cognitive, genetic, neuroimaging and other kinds of measures as predictors of psychosis and related outcomes, using existing datasets supplied by the instructor. SO

* **PSYC 3113b / CGSC 313 / CGSC 3130b / PHIL 3305b, Philosophy for Psychologists**
Joshua Knobe
Introduction to frameworks developed within philosophy that have applications in psychological research. Principal topics include the self, causation, free will, and morality. Recommended preparation: a course in philosophy or psychology. HU, SO

PSYC 3129b / LING 1460b / WGSS 1145b, Language and Gender Natalie Weber
An introduction to linguistics through the lens of gender. Topics include: gender as constructed through language; language variation as conditioned by gender and sexuality within and between languages across the world; real and perceived differences between male and female speech; language and (non)binarity; gender and noun class systems in language; pronouns and identity; role of language in encoding, reflecting, or reinforcing social attitudes and behavior. This course was previously offered as PSCY 329. SO

PSYC 3240a / CGSC 3240 / NSCI 3230, Human Neuropsychology Randolph Helfrich
Neuropsychology is the fascinating study of how brain functions give rise to behavior and cognition. This course offers an in-depth exploration of how brain lesions provide crucial insights into the workings of the human mind. Through case studies of individuals with various brain injuries and disorders, students learn how specific brain areas contribute to attention, memory, language or/and motor control. By examining the consequences of various pathologies, students learn about the connections between brain structure and function, offering a unique window into the complex processes that govern human behavior. The course covers state-of-the-art neuroimaging and neurophysiology techniques and clinical assessment methods to understand how disruptions to the brain's architecture lead to cognitive and behavioral changes. We discuss a range of neuropsychiatric conditions, including stroke, epilepsy, dementia, movement disorders, or traumatic brain injury to understand the challenges presented by these disorders. Whether it's unraveling the mysteries visual agnosia, attention and memory disorders, or studying the profound shifts in personality after frontal lobe injury, this course provides an exciting journey into the brain's function from the perspective of individual patients. Prerequisite: PSYC 160/NSCI 160.

PSYC 3317a / EDST 1237a / LING 1179a, Language and Mind Maria Pinango
The structure of linguistic knowledge and how it is used during communication. The principles that guide the acquisition of this system by children learning their first language, by children learning language in unusual circumstances (heritage speakers, sign languages) and adults learning a second language, bilingual speakers. The processing of language in real-time. Psychological traits that impact language learning and language use. SO RP 0 Course cr

PSYC 3318a / LING 2200a, Phonetics I Jason Shaw
Each spoken language composes words using a relatively small number of speech sounds, a subset of the much larger set of possible human speech sounds. This course introduces tools to describe the complete set of speech sounds found in the world's spoken languages. It covers the articulatory organs involved in speech production and the acoustic structure of the resulting sounds. Students learn how to transcribe sounds

using the International Phonetic Alphabet, including different varieties of English and languages around the world. The course also introduces sociophonetics, how variation in sound patterns can convey social meaning within a community, speech perception, and sound change. SO o Course cr

* **PSYC 3320a / ENGL 3082a / FILM 2800a, The Science and Culture of Memory** John Williams

This is an FAS-sponsored cross-divisional course. This course offers a comparative and interdisciplinary approach to the science and culture of memory. We aim to bring traditional philosophies, narratives, and histories of memory into conversation with both long established and cutting-edge research findings on the neuroscience of memory. Questions explored in the course include: What is memory and how does it work? How has memory been conceptualized over time in both culture and science? What are the various media through which we process memories, including collective and individual forms? What can we learn from moments of mnemonic failure? What new technologies of memory are on the horizon? How is our vision of the future influenced by the content and processes of memory? In wrestling with these questions, we encounter a wide selection of narratives, art objects, films, and scientific data. Students also have an opportunity to explore their own experiences in learning and memory (including experiential assignments, e.g., asking them to memorize certain things and report on the experience, as well as opportunities to reflect on their experiences of and access to forms of collective, communal memory). HU, SO

PSYC 3327a / LING 2270a, Language and Computation I Staff

This course introduces the design and analysis of computational models of language. There are many properties of language that make it challenging to handle computationally: First, language is ambiguous—a given word or sentence can have many possible meanings. Second, our linguistic experience is sparse—many aspects of language (e.g., certain sentence structures) occur very rarely, posing a challenge for computational systems that learn from data. Third, language has an enormous amount of hidden structure—words and other linguistic units can have complex relationships with each other that are not apparent on the surface. In this course, we explore the computational approaches that can overcome these challenges. Topics include finite state tools, neural networks, Bayesian approaches, computational morphology and phonology, grammar and parsing, lexical semantics, and the use of linguistic models in applied problems. Prerequisite: prior programming experience or permission of instructor. QR, SO

* **PSYC 3372a / LING 4900a, Research Methods in Linguistics** Simon Charlow

Development of skills in linguistics research, writing, and presentation. Choosing a research area, identifying good research questions, developing hypotheses, and presenting ideas clearly and effectively, both orally and in writing; methodological issues; the balance between building on existing literature and making a novel contribution. Prepares for the writing of the senior essay.

PSYC 3380b / CGSC 3380b / NSCI 3380b, Minds, Brains, and Machines Julian Jara-Ettinger

Leibniz compared the brain to a mill, Freud to a hydraulic system, and now we think of it as a computer. Have we gotten it right? If so, what kind of computer is the brain? And what kind of software is the mind? This course explores these questions by integrating classical and cutting-edge findings from artificial intelligence, cognitive

science, neuroscience, philosophy, and psychology. In this course you learn how modern artificial intelligence works—including deep neural networks, program synthesis, and neuro-symbolic approaches. You learn how to think about artificial intelligence from the perspectives of cognitive science and neuroscience. And you learn how current advances in AI are helping us understand how the mind and brain works. Conversely, you also learn how advances in psychology and neuroscience have played a key role in the biggest ideas in AI. This course is ideal for a variety of students: Psychology and cognitive science majors that want to learn about AI. CS students that want to know how to think about AI from a cognitive perspective. And anyone who wants to know how to think critically about all the advances in the study of minds, brains, and machines. Students are strongly encouraged to have taken either Introduction to Psychology (PSYC 110), or Introduction to Cognitive Science (CGSC 110). Introduction to Computer Science (CPSC 201) is also ideal. SO

* **PSYC 3530a, Psychology of Marketing and Media** Katherine Battle
This class explores the psychology of marketing and media, from the psychological tools used by marketers and media to sell products and ideas to the psychological impacts of marketing and media on the consumer. The course uses a theoretical and empirical framework of psychology to examine how marketing and media use psychology to influence consumers, why and how consumers are vulnerable to those messages, and what impact that influence has on consumers' behavior, self-perception, and mental health. We incorporate theories and practices from a wide range of branches of psychology, including social, clinical, industrial/organizational, neuropsychology, developmental, environmental, and media psychology as a framework and foundation for the course. Case studies include but are not limited to Disney, social media corporations, news outlets, food companies, and companies marketing products considered addictive. Interwoven topics include clinical ramifications of marketing and media as well as bias formation from media and film consumption. Students use psychological principles to analyze specific examples from advertisements, social media, news outlets, and film from the perspective of the marketer and the consumer. Prerequisite: One introductory level psychology course. Preference is given to psychology majors.

PSYC 3531b / LING 3310b, Neurolinguistics Maria Pinango
The study of language as a cognitive neuroscience. The interaction between linguistic theory and neurological evidence from brain damage, degenerative diseases (e.g., Alzheimer's disease), mental illness (e.g., schizophrenia), neuroimaging, and neurophysiology. The connection of language as a neurocognitive system to other systems such as memory and music. At least one class that introduces students to linguistic theory and linguistic argumentation from at least one perspective, including any of the following: (1) LING 217 Language and Mind, (2) LING 110 Intro to linguistics, (3) LING 253 Syntax 1, (4) LING 112 Historical Linguistics, (5) LING 232 Phonology 1, (6) LING 220 General Phonetics, or (7) Instructor permission. SC, SO
o Course cr

* **PSYC 3537a, Multicultural Psychology** Mica Rencher
Multicultural Psychology examines how identity, and its social contexts, impacts human behavior and perspectives. This course will introduce students to theoretical and practical approaches used to assess the impact of culture on various psychological processes. Such examination will be guided by real-world application of material

covered in class and required readings. Topics will include class, culture, family, gender, mental and physical health, race, religion and spirituality, and stereotyping and prejudice. SO

* **PSYC 3585b / ECON 4485b, Behavioral Economics** Maria Saez Marti
Study of foundational topics in behavioral economics. Focus on theories of single-agent behavior that aim to incorporate non-standard phenomena into classic economic models, with consideration of intertemporal decision-making, choice under uncertainty, and learning. Prerequisites: ECON 121; some familiarity with game theory and probability theory. SO

PSYC 3630b / NSCI 3550b, Social Neuroscience Stephanie Lazzaro
Exploration of the psychological and neural mechanisms that enable the formation, maintenance, and dissolution of social relationships. Topics include the neuroscience of how we form impressions and decide whether to instigate relationships with others; how we build relationships through trust, cooperation, attachment, conflict, and reconciliation; and group-level processes including intergroup bias, moral judgment, and decision making. Prerequisite: PSYC 160 SC

PSYC 3635b / NSCI 3400b, Cognitive Neuroscience Steve Chang
This course covers how cognition is made by the brain. Students learn brain mechanisms underlying human cognition, including making decisions, paying attention, regulating emotion, remembering events, as well as understanding others. The course discusses both established and newly emerging findings based on several landmark experiments in both humans and animals. During this process, students are also introduced to cutting-edge techniques in cognitive neuroscience for studying human cognition. Prerequisite: PSYC 160 or specific chapter readings from the instructor. SC

* **PSYC 3712a / ER&M 3013a, Native American Mental Health** Mark Beitel and Christopher Cutter
Issues of health policy, research, and service delivery in Native American communities, with a focus on historical antecedents that shape health outcomes and social policy for indigenous communities. Urgent problems in health and wellness, with special attention to Native American mental health. The roles of the Indian Health Service, state and local agencies, and tribal health centers; comparison of Native American and European American conceptions of health and illness. SO

* **PSYC 4080a, Topics in Thinking** Woo-Kyoung Ahn
A survey of psychological studies on thinking and reasoning, with discussion of ways to improve thinking skills. Topics include judgments and decision making, counterfactual reasoning, causal learning, inductive inferences, analogical reasoning, problem solving, critical thinking, and creativity. Students who have taken PSYC 179 are not eligible to enroll in this course. SO

* **PSYC 4200b / CBIO 4200b / CGSC 4200b / NSCI 4400b, Topics in Clinical Neuroscience** Tyrone Cannon
An overview and examination of the neuroscience of psychiatric illness. We focus on cutting-edge research in humans and animals aimed at understanding the biological mechanisms that underlie psychiatric illness. Although these questions date back to early philosophical texts, only recently have experimental psychologists and neuroscientists begun to explore this vast and exciting domain of study. We discuss the

evolutionary and developmental origins of individual differences in human personality, measurement issues, fundamental dimensions of psychopathology, stability/plasticity, heritability, and implications therapeutic interventions as well as the associated broader implications for public policy. A major focus is on the neurobiology of fear and anxiety, including brain circuits, molecular genetic pathways, and epigenetics. A secondary focus is on differences in behavior and biology that confer risk for the development of depression and addiction, including the biological systems involved in hedonic pleasure, motivated goal pursuit, and the regulation of impulses in the face of everyday temptation. Students should have some background in psychology; PSYC 110 and PSYC 160 preferred. SO

* **PSYC 4220b / CGSC 4260b / EP&E 4490b / PHIL 4426b, The Cognitive Science of Morality** Joshua Knobe

Introduction to the emerging field of moral cognition. Focus on questions about the philosophical significance of psychological findings. Topics include the role of emotion in moral judgment; the significance of character traits in virtue ethics and personality psychology; the reliability of intuitions and the psychological processes that underlie them. HU

* **PSYC 4250b / CGSC 4250b, Social Perception** Brian Scholl

Connections between visual perception, among the earliest and most basic of human cognitive processes, and social cognition, among the most advanced forms of higher-level cognition. The perception of animacy, agency, and goal-directedness; biological motion; face perception (including the perception of facial attractiveness); gaze processing and social attention; "thin-slicing" and "perceptual stereotypes"; and social and cultural influences on perception. SO

* **PSYC 4260a, Foundations of Logical Thought in Cognitive Development** Nicolò Cesana-Arlotti

This is a seminar surveying the cognitive, developmental, and evolutionary origins of our capacities to use logical representations and deductive inferences to learn, form predictions, and make decisions. The seminar explores the growing field of research that investigates the foundations of logical thought in language acquisition, in preverbal infants' cognition, and in the mind of our close and distant relatives in the animal world. There are no formal prerequisites for this course, but this course is designed for advanced students who have already completed introductory psychology coursework (PSYC 110, Introduction to Psychology) SO

* **PSYC 4280b / NSCI 4420b, Neuroscience of Decision-Making** Stephanie Lazzaro

An overview and examination of the neuroscience of decision making. Interdisciplinary course highlighting research from cognitive neuroscience, psychology, behavioral economics, finance, marketing, computer science, and public health. Topics include utility and value, reinforcement learning, risky decision making, impulsivity and self control, social decision making, psychopathology, and commercial applications (e.g., neuromarketing and neurofinance). Permission of the instructor. SC

* **PSYC 4320a / NSCI 4550a, Under Pressure: The Psychology of Stress** Dylan Gee

While stress serves an adaptive function that is critical for survival, chronic or extreme stress can have a negative impact on mental and physical health. Understanding the broad range of factors that can exacerbate or reduce stress, how we respond to stress, and the ways that experiences and effects of stress can differ across people and across

stages of development can provide foundational insights for dealing with stress in our lives. This seminar integrates psychological, neurobiological, social, developmental, and clinical perspectives on stress. In addition to developing a foundation in the theoretical and empirical literature on stress, students will have the opportunity to engage in experiential learning related to coping skills drawn from evidence-based interventions in psychology. Priority given to seniors. Prerequisites: There are no formal prerequisites for the course, but one of the following is strongly recommended: PSYC 110, PSYC 160, PSYC 230, PSYC 335, PSYC 352, or PSYC 376. SO

* **PSYC 4360b / EDST 1436b / EDST 436, Translating Developmental Science into Educational Practice** Julia Leonard
Recent insights from developmental psychology and neuroscience on synaptic plasticity, critical periods, metacognition, and enriched environments are ripe for application to improve children's lives. Yet sometimes the translation of research into practice is a bridge too far. In this course, we discuss cutting-edge research in developmental cognitive and neural sciences and examine how these findings can inform policy and educational practice. SO

* **PSYC 4430a / NSCI 443 / NSCI 4430a, Topics in the Neuroscience of Memory** Stephanie Lazzaro
A seminar style overview and examination of the neuroscience of memory. In this seminar, we discuss some significant historical findings in the study of memory, as well as focus on more recent, current research. How memory works and how memories can be altered and improved are discussed. Topics may include sleep and memory consolidation, re-consolidation, false memories, superior autobiographical memory, as well as the the effects of rewards, novelty, exercise, and social cues on various types of memory. Goals for this course include acquiring an in-depth and integrative understanding of the current research and directions surrounding the neuroscience of memory, and thinking critically about the methodology and evidence in the research papers that are read and discussed. We discuss strengths and limitations of the research and theories, as well as real-world applications. Prerequisites: PSYC 110, PSYC 160, or PSYC 130

* **PSYC 4490a / NSCI 4490a, Neuroscience of Social Interaction** Steve Chang
This seminar covers influential studies that inform how the brain enables complex social interactions from the perspectives of neural mechanisms. Students thoroughly read selected original research papers in the field of social neuroscience across several animal species and multiple modern neuroscience methodologies. In class, the instructor and students work together to discuss these studies in depth. Focused topics include neural mechanisms behind brain-to-brain coupling, empathy, prosocial decision-making, oxytocin effects, and social dysfunction. Prerequisite: PSYC 160 or permission from the instructor. SC

* **PSYC 4570a, Communicating Psychological Science** Laurie Santos
Examination of best practices in the communication of psychology. The course explores strategies for communicating psychological findings to varying audiences (e.g., policy makers, popular media) and in varying formats (op-eds, long-form articles, podcasts, short videos) with the goal of gaining the skill and confidence necessary to give psychological science its broadest possible reach. Students choose specific psychological topics based to cover in their communication projects and explore current challenges within psychology communication (e.g., the ethics of psychology

communication, exploring the issue of replication in the field of psychological science). Readings include examples of different forms of psychology communication along with the published empirical papers associated with those readings. Seminar discussions include a workshop component where students provide feedback on other students' creative writing/communication projects. Graded assignments include both group-based creative projects (short videos and podcast clips) and individual written work, including weekly directed writing exercises. Prerequisites: PSYC 110, PSYC 200 (or equivalent), and at least two other upper-level courses in PSYC. SO

* **PSYC 4620a, Infantile Amnesia** Nick Turk-Browne
Memory is essential to who we are, how we behave, and what we value. It is therefore striking that humans lack memories for the first few years of life. Such infantile amnesia was first described a century ago and many theories have been proposed since then. However, there has been major empirical progress over the past decade. This seminar draws broadly on behavioral and neuroscientific research in humans and animals to understand infantile amnesia. Through this topic, students learn about different types of memory, the underlying brain systems, how memory and other cognitive abilities develop, and state-of-the-art tools for studying remembering and forgetting. Prerequisite: PSYC 160/NSCI 160, The Human Brain. SC, SO

* **PSYC 4700a, Suicide and Self-Destructive Behaviors** Shirley Wang
All animal species are imbued with an innate drive for self-preservation and gene survival. Owls camouflage themselves from predators, bears hibernate to survive harsh winters, fish leap out of the water to escape danger, and humans engage in a wide range of behaviors to maximize their own survival and that of their genes. However, in some cases, humans also experience thoughts and urges to intentionally hurt themselves—and in extreme cases—to end their own lives. This course explores past and current cutting-edge models for understanding suicide and other self-destructive behaviors, such as nonsuicidal self-injury, eating disorders, and substance use. We consider the classification, etiology, assessment, prevention, and treatment of such behaviors from psychological, developmental, clinical, social, and neurobiological perspectives. Students develop a foundation in theoretical and empirical research on self-destructive behaviors, as well as empirically based treatments. Prerequisite: PSYC 110 OR PSYC 180 is required. SO

* **PSYC 4790b / NSCI 4790b, Computational Basis of Seeing and Thinking** Ilker Yildirim
This seminar aims to discuss the computational basis of seeing and thinking in the mind and brain. The course be organized around three central questions in brain and cognitive sciences. First, we start with this question of how perception gets us to cognition: How is it that perception transforms raw, unstructured incoming sensory signals arising from our physical environments—the light that bounces off surfaces and arrives at the retina, raw audio waves hitting the ears, or the vibro-tactile sensations felt at the fingertips when touching a surface—into things like objects, scenes, events, and agents, into things that we can think about? We draw upon readings and classroom discussions, primarily computational literature, to explore representational and algorithmic hypothesis about seeing and thinking in the mind. Second, we observe that these cognitive hypotheses about mental representations are typically developed in rather sterile, or as scientists we like to call it "controlled," settings. We proceed to ask how these cognitive hypotheses about mental representations can be scaled to the

messiness and complexity of the real world. This leads us to issues at the intersection of AI, psychology, and cognitive science. Finally, we observe that in most cases, cognitive representations about mental representations don't plausibly or at least readily map onto a brain implementation. So, we ask: How is it that through the distributed and dynamic activity in our brain's neural circuits, we come to think thoughts about objects and agents, mentally simulate what will happen next, and plan actions accordingly? We explore multi-level theories of intelligence, that make bridges across AI, neuroscience and cognitive science. SO

* **PSYC 4925a, Directed Research** Yarrow Dunham
Empirical research projects or literature review. A student must be sponsored by a faculty member, who sets the requirements and supervises the student's progress. To register, the student must download a tutorial form from http://psychology.yale.edu/undergraduate/undergraduate-major-forms, complete it with the adviser, and submit it to the director of undergraduate studies by the deadline listed on the form. The normal minimum requirement is a written report of the completed research or literature review, but individual faculty members may set alternative equivalent requirements. May be elected for one or two terms. May not be used for the Psychology senior essay requirement.

* **PSYC 4950a, Research Topics** Yarrow Dunham
Empirical research project or literature review. A student must be sponsored by a faculty member, who sets the requirements and supervises the student's progress. To register, the student must download a tutorial form from http://psychology.yale.edu/undergraduate/undergraduate-major-forms, complete it with the adviser, and submit it to the director of undergraduate studies by the date indicated on the form. The normal minimum requirement is a written report of the completed research or literature review, but individual faculty members may set alternative equivalent requirements. May be elected for one or two terms. May not be used for the Psychology senior essay requirement. ½ Course cr

* **PSYC 4990a, Senior Essay** Yarrow Dunham
Independent senior research project (either empirical research or literature review), conducted under the guidance of a faculty adviser who sets the requirements and supervises the research. To register, the student must download a tutorial form from http://psychology.yale.edu/undergraduate/undergraduate-major-forms, complete it with the adviser, and submit it by the deadline indicated on the form. The normal minimum requirement is a written report of the completed research or literature review, but individual faculty members may set alternative equivalent requirements. A paper of 5,000 words or more meets the writing needed for the senior requirement. To be considered for Distinction in the Major, the paper should be submitted at least one week before the last day of classes and will be graded by the adviser and a second reader assigned by the DUS.

Punjabi (PNJB)

PNJB 1100a, Elementary Punjabi I Staff
Introduction to the Punjabi language in its cultural context. Development of fundamental speaking, listening, reading, and writing skills through the application of communicative methods and the use of authentic learning materials. Course

taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. Credit only on completion of PNJB 120. L1 RP 1½ Course cr

* **PNJB 1200b, Elementary Punjabi II** Staff
Continuation of PNJB 110. Further development of speaking, listening, reading, and writing skills through the application of communicative methods and the use of authentic learning materials. Prerequisite: PNJB 110 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L2 RP 1½ Course cr

* **PNJB 1300a, Intermediate Punjabi I** Staff
The important target of this course is to develop basic Punjabi Language skills (reading, writing, listening and speaking). This is approached through the theme-based syllabus, discussion in small groups and paired activities on the cultural background of Punjab or Punjabi culture. As well as, the listening and speaking skills would be developed by using the media such as educational material, Punjabi movies, music and computer lab sessions. The usage of the textbooks would lead us to learn grammatical rules of the Punjabi language. The students are approached individually, since the class typically consists of students in the various backgrounds. Prerequisite: PNJB 120 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail david.ortega@yale.edu for more information. L3 RP 1½ Course cr

* **PNJB 1400b, Intermediate Punjabi II** Staff
The important target of this course is to develop basic Punjabi Language skills (reading, writing, listening and speaking). This is approached through the theme-based syllabus, discussion in small groups and paired activities on the cultural background of Punjab or Punjabi culture. As well as, the listening and speaking skills would be developed by using the media such as educational material, Punjabi movies, music and computer lab sessions. The usage of the textbooks would lead us to learn grammatical rules of the Punjabi language. The students are approached individually, since the class typically consists of students in the various backgrounds. Prerequisite: PNJB 130 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail david.ortega@yale.edu for more information. L4 RP 1½ Course cr

Religious Studies (RLST)

* **RLST 0035b / HIST 0623b / HUMS 0360b / JDST 0035b, Jerusalem: Judaism, Christianity, Islam** Sarit Kattan Gribetz
The Old City of Jerusalem is just 0.35 square miles large, about half the size of Yale's campus. Have you ever wondered what makes this tiny city so beloved to—and the object of continual strife for—Jews, Christians, and Muslims? Through engagement with a wide range of sources—including biblical lamentations, archeological excavations, qur'anic passages, exegetical materials, medieval pilgrim itineraries, legal documents, maps, poetry, art, architecture, and international political resolutions—

students develop the historiographical tools and theoretical frameworks to study the history of one of the world's most enduringly important and bitterly contested cities. Students encounter persistent themes central to the identity of Jerusalem: geography and topography; exile, diaspora, and return; destruction and trauma; religious violence and war; practices of pilgrimage; social diversity; missionizing; the rise of nationalism; peace efforts; the ethics of storytelling; and the stakes of studying the past. Enrollment limited to first-year students. HU RP

RLST 171b / EALL 2190b / EAST 2201b / HUMS 214b / PHIL 1119b, Introduction to Chinese Philosophy Lucas Bender
This course represents an introduction to the most important philosophical thinkers and texts in Chinese history, ranging from roughly 500 BC–1500 AD. Topics include ethics, political philosophy, epistemology, and ontology. We discuss the basic works of Confucian and Daoist philosophers during the Warring States and early imperial eras, the continuation of these traditions in early medieval "dark learning," Buddhist philosophy (in its original Indian context, the early period of its spread to China, and in mature Chinese Buddhist schools such as Chan/Zen), and Neo-Confucian philosophy. The course emphasizes readings in the original texts of the thinkers and traditions in question (all in English translation). No knowledge of Chinese or previous contact with Chinese philosophy required. HU o Course cr

RLST 1030a / HEBR 1170a, Elementary Biblical Hebrew I Dina Roginsky
An introduction to biblical Hebrew. Intensive instruction in grammar and vocabulary, supplemented by readings from the Bible. No prior knowledge of Hebrew required. L1

RLST 1150a / AMST 1115a, How to Build an American Religion Staff
This course offers an introduction to religion in the United States and theories from religious studies that argue its patterns. HU o Course cr

* **RLST 1170b, What Didn't Make It into the Bible** Maria Doerfler
Over two billion people alive today consider the New Testament to be sacred scripture. But how did the books that made it into the bible get there in the first place? Who decided what was to be part of the bible and what wasn't? How did these decisions affect the structure of nascent Christian communities, their relationship to surrounding Greco-Roman and Jewish society, and the subsequent development of Christian churches? How would the history of the world's largest organized religion look differently if a given book didn't make the final cut and another one did? Hundreds of ancient Christian texts are not included in the New Testament. "What Didn't Make It into the Bible" focuses on these excluded writings and uses them to help reconstruct the earliest Christian communities. We explore Gnostic gospels, hear of a five-year-old Jesus throwing temper tantrums while killing (and later resurrecting) his classmates, peruse ancient Christian romance novels, tour heaven and hell, read the garden of Eden story told from the perspective of the snake, and learn how the world will end. This seminar assumes no prior knowledge of Judaism, Christianity, the bible, or ancient history. It is designed for students who are part of faith traditions that consider the bible to be sacred, as well as communal structures that eventually lost the battles of history and to keep asking the question "why." In critically examining these ancient narratives and the communities that wrote them, students learn about the content and history of the New Testament, better appreciate the diversity of formative Christianity, understand the historical context of the early church, examine the earliest social forms

of Christianity, and explore the politics behind what did and did not make it into the bible. WR, HU

RLST 1270a / HUMS 4501a / PHIL 1118a / SAST 2610a, Buddhist Thought: The Foundations Staff

This class introduces the fundamentals of Buddhist thought, focusing on the foundational doctrinal, philosophical, and ethical ideas that have animated the Buddhist tradition from its earliest days in India 2500 years ago down to the present, in places such as Tibet, China, and Japan. Though there will be occasional discussion of the social and practical contexts of the Buddhist religion, the primary focus of this course lies on how traditional Buddhist thinkers conceptualize the universe, think about the nature of human beings, and propose that people should live their lives. Our main objects of inquiry are therefore the foundational Buddhist ideas, and the classic texts in which those ideas are put forth and defended, that are broadly speaking shared by all traditions of Buddhism. In the later part of the course, we take up some of these issues in the context of specific, regional forms of Buddhism, and watch some films that provide glimpses of Buddhist religious life on the ground. HU o Course cr

RLST 1315a / HSHM 2210a / HUMS 1315a, What Was the University? Noreen Khawaja

A deep history of the university as a political, intellectual, and ritual institution. Focus on key chapters and cases in the university's formation, from the mutual-aid societies of medieval Europe to modern research institutions such as Yale. What conditions gave rise to the particular type of school we call a university? How have universities played a role in the development of modern society? How might the history of this institution help us understand its role at the center of politics today? HU o Course cr

RLST 1480a / ER&M 2519a / HIST 1219a / JDST 200 / JDST 2000a / MMES 1149a, Jews and the World: From the Bible through Early Modern Times Ivan Marcus

A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings. Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP o Course cr

RLST 1600b / HIST 1280b / ITAL 1315b, The Catholic Intellectual Tradition Carlos Eire

Introductory survey of the interaction between Catholicism and Western culture from the first century to the present, with a focus on pivotal moments and crucial developments that defined both traditions. Key beliefs, rites, and customs of the Roman Catholic Church, and the ways in which they have found expression; interaction between Catholics and the institution of the Church; Catholicism in its cultural and sociopolitical matrices. Close reading of primary sources. HU o Course cr

* **RLST 2010a / HIST 3232a / HUMS 4430a / JDST 3270a / MMES 3342a, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community

and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

RLST 2020b / HIST 1645b / JDST 3265 / MMES 1148, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus

Jewish culture and society in Muslim lands from the time of the Prophet Muhammad to that of Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU o Course cr

* **RLST 2120a / NELC 2620a, Death, Memorial, and Immortality in the Hebrew Bible and its World** Jacqueline Vayntrub

What does the Hebrew Bible have to say about human mortality, divine immortality, and the afterlife? Are these ideas more consistent with later Jewish and Christian notions of death and the afterlife, or are they closer to the views of their ancient Near Eastern neighbors? In this course we examine the development of biblical and ancient Near Eastern concepts of death and life-after-death. We look at a variety of different types of texts that touch upon these themes, such as narrative, poetry, ritual, and law in biblical and other ancient Near Eastern texts. Topics include the depiction of human mortality and divine immortality in literature, dying as a social process, the development of the notion of an afterlife and the concept of the 'soul', and communication with the dead, how these texts have been received in the West, and how they have shaped inherited ideas of the immortality of the soul, human suffering, and divine justice. The aim of the course is to develop an awareness of the ancient historical and cultural context in which these texts were authored, and to deepen our understanding of modern views of mortality. HU

* **RLST 2290a / EAST 4602a, Buddhist Ethics** Staff

In this course, we will explore ethical issues in Buddhism across a wide range of contexts and time periods. Together, we will examine how Buddhism addresses fundamental moral and ethical questions, such as: How should I behave? What are the implications of my actions? What is good and bad? How can we bridge the gap between knowing what is right and acting accordingly? The course is divided into two parts. In the first part, we will explore foundational topics in Buddhist ethics, focusing on themes such as retribution, precepts, the Bodhisattva's path, meditation, and the role of feelings. The second part centers on Buddhism's responses to contemporary ethical issues, including abortion, gender, race, and environmental ethics. This course integrates both the theory and practice of ethics. The structure and assignments are designed to help you engage with theoretical systems that may differ from those you are familiar with, while also applying these abstract ideas to reflect on the relationship between theory and practice. HU

* **RLST 2310b / HIST 3226b / JDST 3470, How the West Became Antisemitic: Jews and the Formation of Europe 800–1500** Ivan Marcus

Students study how Jews and Christians interacted on a daily basis as medieval Europe became more restrictive and antisemitic, a contributing factor to the Holocaust. In this writing seminar, students discuss a variety of primary sources in class—laws, stories, chronicles, images—while researching and writing their own seminar paper structured by sessions on topics, bibliographies, and outlines. WR, HU

* **RLST 2330a / ENGL 3846a / HUMS 2530a, Poetry and Faith** Christian Wiman
Issues of faith examined through poetry, with a focus on modern poems from 1850 to the present. Poems from various faith traditions studied, as well as to secular and antireligious poetry. HU

* **RLST 2510b / NELC 1290b, Magic and Ritual in Ancient Egypt and the Near East** John Darnell
Introduction to ancient Egyptian magic and rituals with an overview on the use of magic and discussion of the different rituals and festivals attested in Ancient Egypt and the Near East. HU

* **RLST 2555a / HUMS 2555a, Metaphysical Fictions** Nancy Levene
This course takes up works that explore predicaments in historical and conceptual reality. At issue are world building, disruption, and alteration, perspective and time, relationship, interpretation, and varieties of threat and response. HU

* **RLST 2820a / HUMS 4598 / PHIL 4474 / SAST 2690a, Philosopher Queens of Hinduism and Buddhism** Sonam Kachru
Inspired by the bestselling book *The Philosopher Queens*, this course seeks to make cognitive room for women in the history of Indian (and Indian Buddhist) philosophy, and to reflect on what making such room involves: we explore the arguments and concerns of neglected figures—some human (like Nanduttara or Lalleshwari), some not; some historical (Laksmikaradevi), some not—and explore philosophical concerns involved in the reconstruction of their voices and views. HU

RLST 2830a / HIST 1215a, Reformation Europe, 1450–1650 Staff
Examination of a series of religious revolutions in Europe between 1450 and 1650. The causes and nature of the reformations that changed the religious, political, social, and economic landscapes of early modern Europe and shaped the course of Western civilization as a whole. HU 0 Course cr

* **RLST 2890a / ER&M 4444a, Race, Religion, and Transnational Mobilities** Gana Ndiaye
This course surveys how "migrants" and "desirable migrants" are produced through race and religion in the Americas and Europe. It also examines how racial identities and religious beliefs inform human mobilities and shape the experiences of such mobile persons as settlers, exiles, asylum seekers, temporary workers, and economic migrants. By the end of the course, participants will familiarize themselves with the crucial roles that religious beliefs and practices play in causing and responding to human mobilities. Students will also gain familiarity with the ways in which migrants' religious practices transform local cultures, politics, and societies as their own religious practices are reconfigured by and in the context of host nations. Topics to be covered include citizenship and cultural difference, religion and the public sphere, multiculturalism, Islam and democracy, Christian Pentecostal missions, liberation theology, and African diasporic religions. SO

* **RLST 2930a / HIST 2621a, The Sharīʿa 101: From Medieval Jurists to Modern States, Why Islamic Law Matters Today** Matthew Steele
This course aims to provide students with an alternative reading of the Islamic legal tradition. It upends the view that Islamic law was in some way allergic to change. Likewise, it problematizes the notion that the medieval legal tradition either lacked innovation or was rendered obsolete by colonial reforms and modernist critique. It

approaches Islamic law through the speculative enterprise of jurisprudence (*fiqh*), the work of legal scholars to elaborate God's most likely position regarding any legal dilemma. Through the literature and opinions (*fatwā*s) of legal specialists from the ninth through the twentieth century, the class interrogates the relationship between change and continuity in Islamic law. We explore how jurisconsults balanced the doctrine of trans-regional schools of law with the local dilemmas faced by the communities in which they lived and served. Similarly, we consider not only the opportunities but also the risks that arise from adapting Islamic law to local conditions. The course challenges students to ask what is change within a tradition? In the debates and polemics of legal scholars, we contemplate the appeal and the limitations of reform within Islamic law, tracing how both have been contested and have evolved across different geographies and periods in the Muslim World. Likewise, we rethink the boundaries of continuity. We question how a legal school and a legal canon are constructed and revised, examining the ways in which both are capable of reinforcing —or imperiling—the Islamic legal tradition. Last, we explore the endurance of Islamic law in contemporary Muslim societies. The course reflects on the processes and the consequences of various projects of "modernizing" the Sharīʿa, asking how the institutions of the colonial and postcolonial state have reconfigured Islamic law in radically different ways. HU

* **RLST 3130a / ER&M 3030a, Islam in Africa** Gana Ndiaye
Islam is the dominant religion in many African nations. Countries such as Libya, Comoros, and Western Sahara have Muslim populations exceeding 99%. In Senegal, over 95% of the population adheres to Islam, while more than 79% of Egyptians identify as Muslim. Nigeria has the largest Muslim population on the continent, with over 100 million Muslims. This course focuses on the histories, politics, and cultures of Muslim Africa. We examine the spread of Islam across the continent from the 7th century through trade, education, and jihad. Drawing primarily from anthropology, we explore the impact of faith on governance and social structures, as well as its interactions with other religious traditions on the continent. By the end of the course, students will: a) learn about key issues in the study of Islam in Africa, including Islam noir, Africanization of Islam, Ajami, and lived Islam, b) develop tools for studying how Africans on the continent and the diaspora practice Islam in various contexts and time periods, and c) acquire research skills for studying Islam ethnographically. HU, SO

* **RLST 3145a / HIST 3265a / ITAL 3387a, Francis of Assisi and His Legacy** Carlos Eire
Francis of Assisi is undoubtedly one of the most important figures in European history. As one of Catholicism's most revered saints (often considered to be the greatest male saint ever), his radical message of voluntary poverty, humility and fraternity significantly revived the Catholic church in a moment of profound crisis, and has since been accepted as one of the foundational elements of European thought, receiving universal admiration from diverse thinkers who are often unaffiliated with the Catholic tradition. This course seeks to take both challenges head on. Its pedagogical intent is three-fold. First, by offering a comprehensive overview of the layered accumulation of narratives that has given us the Francis figure so beloved today, it encourages students to examine the ambiguous boundaries of "reliability" with regard to historical narratives, especially those with a mythopoetic flavor. Other than the well-known "Little Flowers", students are also exposed to less-known "lives" of the saint and are

expected to critically compare these sources. Second, students are invited to Socratically wrestle with Francis' spiritual legacy in light of its obvious conflict with prevalent notions of the "good life" in contemporary America. Third, students will gain a robust understanding of the Franciscan tradition which has left its footprint in vast regions outside of Europe (Jerusalem, East Asia, the Americas), has generated an important school of theology, and continues to stoke prominent public debates through controversial modern figures such as Padre Pio. Background readings on medieval religious history will also be provided. Topics will include orthodoxy and heresy, factional conflict within religious orders, missionary activities, mysticism, female religious life, and faith and the visual arts. L4, HU

* **RLST 3240a / HIST 3768a / JDST 3451a / PLSC 3464a, The Global Right: From the French Revolution to the American Insurrection** Elli Stern

This seminar explores the history of right-wing political thought from the late eighteenth century to the present, with an emphasis on the role played by religious and pagan traditions. This course seeks to answer the question, what constitutes the right? What are the central philosophical, religious, and pagan, principles of those groups associated with this designation? How have the core ideas of the right changed over time? We do this by examining primary tracts written by theologians, political philosophers, and social theorists as well as secondary literature written by scholars interrogating movements associated with the right in America, Europe, Middle East and Asia. Though touching on specific national political parties, institutions, and think tanks, its focus is on mapping the intellectual overlap and differences between various right-wing ideologies. While the course is limited to the modern period, it adopts a global perspective to better understand the full scope of right-wing politics. HU, SO

* **RLST 3300a / ANTH 2252a / SAST 3760a, Religion, Place, and Space** Harini Kumar

This seminar explores why 'placemaking' is significant for practitioners of various religions worldwide. From the holy city of Mecca to the sacred landscape of Banaras in India, religious traditions are tethered to sacred geographies. These locations are often physical sites imbued with sacred energies and social meaning. Religious activities can occur in churches or mosques, forests or mountains, community centers, public squares, or homes. The course materials consider specific religious sites and contexts (including those on the Yale campus), examining how these places simultaneously become sites of worship, articulations of identity and heritage, claims of political significance, and hubs of social and emotional life. Special attention is given to how space and place are gendered, racialized, and shaped by emotions, senses, and memories. HU, SO

* **RLST 3400a / SPAN 4610a, The World(ing) of Tarot** Todne Thomas and Nicholas Jones

This course takes an interdisciplinary approach to the exploration of tarot. It joins together religious studies, social scientific, historical, and aesthetic approaches to teach about contexts of practice, genealogies of tarot phenomena, and their visuality. It establishes a foundational knowledge of tarot by exploring popular culture (mis)representations, tracing its longstanding eclectic history, and studying its archetypes. Conceptually, the course uses tarot as an avenue to discuss conceptual themes of materiality and aesthetics, esotericism, politics, gender, culture, and worlding. Through this guided study of tarot, we explore tarot's enduring, yet

contested appeal and relativize Western epistemologies, including that of the academy itself.

*** RLST 3430b / EAST 4601b, Tibetan Buddhism** Staff
This course provides a broad introduction to the intellectual history, philosophy, practices, and culture of Tibetan Buddhism. In this course, we will approach Tibetan Buddhism through four topics: 1) the historical development of Buddhism in Tibet and its key characters, including major gods, goddesses, and human figures; 2) Buddhist ideas about a central theme in nearly all religions: human suffering; 3) ideas and practices that address the problem of human suffering; and 4) the lives of individuals in contemporary Tibetan Buddhist communities. We will we will read and discuss excerpts from Tibetan Buddhist literature; learn to appreciate and analyze Tibetan art and architecture; and watch short documentaries about Tibet that allow us to see how the ideas and practices from the texts connect to peoples' lives today. HU

*** RLST 4100b, Freud and Interpretation** Nancy Levene
A seminar on the contribution of Freud's ideas to the work of interpretation. We read Freud's landmark book, *The Interpretation of Dreams*, as well as some of his essays, and works by other authors and artists that extend or adapt the principles or that spur readers to situate Freud in a wider family of ideas. Themes include desire, duplexity, transposition, mistake, learning, limit, and understanding. Prerequisite: Coursework in philosophy or literature. HU

*** RLST 4180a, Secularisms** Supriya Gandhi
This seminar investigates secularism, a multidimensional and multivalent category, together with its multiple lineages. We read influential scholarly interventions tracing the European genealogies of secularism together with critiques of secularism as a form of power. We put these readings in conversation with discussions of secularism and histories of the secular in global contexts including South and West Asia and North Africa. Through these we critically examine various, sometimes conflicting, understandings of secularism. Deployments of Islam as a foil to secularism, and the question of the Islamic secular, constitute important themes of the course. HU

*** RLST 4210a / HSAR 4421a, Saints and Relics in Medieval Europe** Jacqueline Jung
In medieval Europe, the dead were always present, and none had a greater impact on visual arts, material culture, and architecture than the "very special" dead known as saints. This course examines the men and women whose holy lives and often spectacular deaths loomed so large in the Christian imagination, including biblical saints such as the apostle Peter and Mary Magdalene, early martyrs such as St Stephen and St Foy, and thirteenth-century celebrities such as Francis of Assisi and Christina the Astonishing. We look at how their stories inspired iconic and narrative representations in various media (textual and visual), and how their bodily remains, enshrined in various forms of reliquaries, forged communities of the faithful over centuries. HU

*** RLST 4250a / EAST 4620a, Korean Religions** Staff
This seminar examines the diverse and dynamic religious traditions of Korea including shamanism, Confucianism, Buddhism, Christianity, and New Religions from the pre-modern developments to religious experience in contemporary Korea including North Korea. This course adopts an interdisciplinary approach by discussing the histories and philosophies of religions, and their roles in Korean culture and society. It also deals with women's position in traditional and contemporary Korean religions. Why study Korean

religions? How can we approach Korean religions from an academic perspective? What role have religions played in Korean history, culture, and society? Through a reflection on Korean religions, students are encouraged to think critically about the concept of religion and its role. HU

* **RLST 4450a / NELC 4580a, Introduction to Arabic and Islamic Studies** Travis Zadeh
Comprehensive survey of subjects treated in Arabic and Islamic studies, with representative readings from each. Methods and techniques of scholarship in the field; emphasis on acquiring familiarity with bibliographical and other research tools. Enrollment limited to senior majors in Near Eastern Languages and Civilizations, except by permission of instructor. Previously NELC 490.

* **RLST 4880a and RLST 4890b, Individual Tutorial** Eric Greene
For students who wish, under faculty supervision, to investigate an area in religious studies not covered by regular departmental offerings. The course may be used for research or for directed reading. A long essay or several short ones are required. To apply, students should present a prospectus with bibliography of work they propose to undertake to the director of undergraduate studies together with a letter of support from the faculty member who will direct the work.

* **RLST 4900b, Religion and Society** Maria Doerfler
Seminar on religion and society. Topics covered vary by year, but may include one or more of the following: ritual and its social functions, different concepts of social life, the operation of violence in social relationships, religion as both champion and critic of society, and theoretical models of religion and society.

* **RLST 4910a and RLST 4920a or b, The Senior Essay** Eric Greene
Students writing their senior essays meet periodically in the fall and weekly in the spring for a colloquium directed by the director of undergraduate studies. The essay, written under the supervision of a member of the department, should be a substantial paper between 12,500 and 15,000 words.

Romanian (ROMN)

Russian (RUSS)

RUSS 1100a, First-Year Russian I Julia Titus
An introductory Russian language course designed to develop all four language skills: reading, writing, speaking, and listening comprehension. Use of dialogues, games, and role playing. In addition to readings in the textbook, students read original short stories and learn Russian songs and poems. Oral and written examinations. L1 0 Course cr

RUSS 1200b, First-Year Russian II Staff
Continuation of RUSS 110. After RUSS 110 or equivalent. L2 1½ Course cr

RUSS 1250a, Intensive Elementary Russian Constantine Muravnik
An intensive course that covers in one term the material taught in RUSS 110 and 120. For motivated students. Study of Russian grammar; practice in conversation, reading, and composition. Recommended for prospective seekers of the Advanced Language Certificate and prospective majors in Russian and in Russian and East European Studies. L1, L2 0 Course cr

RUSS 1300a, Second-Year Russian I Staff
The goal of this course is to improve functional competence in speaking and listening by providing culturally-enriched context. The engaging textbook and workbook reflect social, cultural and linguistic norms of contemporary Russia and its diverse regions. In addition, you will be reading some classic and contemporary literature, and using films and other media. After RUSS 120 or equivalent. L3 1½ Course cr

RUSS 1400b, Second-Year Russian II Staff
Continuation of RUSS 130. After RUSS 130 or equivalent. L4 1½ Course cr

RUSS 1450b, Intensive Intermediate Russian Staff
A continuation of RUSS 125 that covers in one term the material taught in RUSS 130 and 140. For students of superior linguistic ability. Prerequisite: RUSS 125. L3, L4 2 Course cr

RUSS 1500a, Third-Year Russian I Constantine Muravnik
Intensive practice in reading, conversation, and composition accompanied by in-depth review and refinement of grammar. Readings from nineteenth-century history and current events are used as the basis of structured conversation, composition, and grammatical practice. Oral examinations and individual and group projects. After RUSS 140 or 145 or equivalent. L5 1½ Course cr

RUSS 1510b, Third-Year Russian II Constantine Muravnik
Continuation of RUSS 150. After RUSS 150 or equivalent. L5 RP 1½ Course cr

RUSS 1600a, Fourth-Year Russian I Anastasia Selemeneva
The goal of this course is to enable students to discuss a variety of concrete and abstract topics such as personal and academic life, social and cultural issues relevant for contemporary Russia in their historical perspective. You will be viewing and discussing fragments of documentaries and feature films, using authentic mass media and fragments from modern Russian literature. All materials for this course have been designed to improve functional competence in speaking, listening, reading and writing by providing culturally-enriched context. After RUSS 151 or equivalent. L5

RUSS 1610b, Fourth-Year Russian II Anastasia Selemeneva
Continuation of RUSS 160. After RUSS 160 or equivalent. L5

* **RUSS 1770a, Fantastika: Russian Fantasy and Science Fiction** Anastasia Selemeneva
This course explores the fantastic in Russian literature and film, while further advancing communicative competence in the Russian language. We trace the development of the fantastic in Russian literature and film in the 20th and 21st centuries, with an eye toward science fiction, which emerged and rose to prominence during the Soviet era. Among the questions we consider are the tension between imagined and real societies and how alternative worlds explore the nature of our own being; the impact of technical progress on human race and whether science fiction anticipates scientific innovation and social change; the appeal of the fantastic to a contemporary reader and how science fiction meets the human need for a desired past or future. Taught in Russian. Prerequisite: RUSS 161 or instructor's permission. L5, HU

* **RUSS 2010a / SLAV 1010a, Writing Literature: Doubles, Doppelgängers, and the Boundaries of the Self** Emily Ziffer

In 2024, a BBC article proclaimed that we are "living in the golden age of the doppelgänger." From celebrity lookalike competitions to the threat of AI duplicates in Hollywood, recent media has demonstrated a renewed fascination with the concept of "the double." In this course, we turn to the rich literary tradition of the "doppelgänger" to examine how writers—from Fyodor Dostoevsky to Kazuo Ishiguro—have engaged with the trope to explore questions of selfhood. We spend the first part of the course considering the theoretical origins of the doppelgänger in gothic literature, turning to concepts of "the self and other" from psychoanalytic, feminist, and postcolonial theory to help us think broadly through the category. In the second part of the course, we read works of literature that feature encounters with a large cast of doppelgänger sub-types, including alter-egos, shadows, ghosts, and evil twins. Finally, we revisit the doppelgänger trope in the digital age to interrogate how advanced technologies have altered the possibilities for "doubling" through innovations such as AI, cloning, and biogenetic de-extinction projects.

* **RUSS 2267a / CPLT 2005a / RSEE 2257a, Memory and Memoir in Russian Culture** Jinyi Chu

How do we remember and forget? How does memory transform into narrative? Why do we read and write memoirs and autobiography? What can they tell us about the past? How do we analyze the roles of the narrator, the author, and the protagonist? How should we understand the ideological tensions between official histography and personal reminiscences, especially in 20th-century Russia? This course aims to answer these questions through close readings of a few cultural celebrities' memoirs and autobiographical writings that are also widely acknowledged as the best representatives of 20th-century Russian prose. Along the way, we read literary texts in dialogue with theories of memory, historiography, and narratology. Students acquire the theoretical apparatus that enables them to analyze the complex ideas, e.g. cultural memory and trauma, historicity and narrativity, and fiction and non-fiction. Students finish the course with an in-depth knowledge of the major themes of 20th-century Russian history, e.g. empire, revolution, war, Stalinism, and exilic experience, as well as increased skills in the analysis of literary texts. Students with knowledge of Russian are encouraged to read in the original language. All readings are available in English. WR, HU

* **RUSS 2310b / RSEE 2219b / TDPS 2016b, History of Russian Theater** Julia Titus

This seminar introduces students to the rich legacy of Russian theater, focusing specifically on the developments of Russian drama from the first third of the nineteenth-century to the early twentieth century. The readings and plays studied in the course are organized chronologically, starting with classic Russian comedies by Alexander Griboyedov and Nikolai Gogol, continuing with dramas by Alexander Ostrovsky and Ivan Turgenev, and ending with late nineteenth-century/early twentieth century plays by Leo Tolstoy and Anton Chekhov. Some readings from Stanislavsky are also included. This course will be taught in Russian, with some readings in English and others in Russian. HU

*** RUSS 3401a / CPLT 3401a / HUMS 3401a / RSEE 3401a, The Stranger: Travel and Belonging Across Empires** Jinyi Chu and Hana Stankova
How has the "stranger" shaped national and imperial identities? This course considers travel and emigration in imperial contexts and brings Russian literature into conversation with European literature. We explore narratives of imperial exceptionalism, Russian parochialism, and the broader imperial contexts that shaped the world in the 19th and 20th centuries. Through a literary journey from the late 18th century to the mid 20th century, students consider how the Russian literary tradition and national identity were shaped by fraught exchanges between Russians and Western Europeans, as well as by Russia's expansion eastward. We read canonical works by writers who questioned or supported empires and think through ways in which they influenced one another. Through close readings, historicization, and theorization, students gain new perspectives on the issues of belonging and alienation in changing imperial contexts. WR, HU

*** RUSS 4900a and RUSS 4910b, The Senior Essay** Claire Roosien
Research and writing on a topic of the student's own devising. Regular meetings with an adviser as the work progresses from prospectus to final form.

Russian, East European, and Eurasian Studies (RSEE)

*** RSEE 2090a / CPLT 2180a / HUMS 2900a, Medicine and the Humanities: Certainty and Unknowing** Matthew Morrison
Sherwin Nuland often referred to medicine as "the Uncertain Art." In this course, we address the role of uncertainty in medicine, and the role that narrative plays in capturing that uncertainty. We focus our efforts on major authors and texts that define the modern medical humanities, with primary readings by Mikhail Bulgakov, Henry Marsh, Atul Gawande, and Lisa Sanders. Other topics include the philosophy of science (with a focus on Karl Popper), rationalism and romanticism (William James), and epistemology and scientism (Wittgenstein). Events permitting, field trips will take us to the Yale Medical Historical Library, the Yale Center for British Art, the Peabody Museum, and the Marsh Botanical Garden. HU

*** RSEE 2219b / RUSS 2310b / TDPS 2016b, History of Russian Theater** Julia Titus
This seminar introduces students to the rich legacy of Russian theater, focusing specifically on the developments of Russian drama from the first third of the nineteenth-century to the early twentieth century. The readings and plays studied in the course are organized chronologically, starting with classic Russian comedies by Alexander Griboyedov and Nikolai Gogol, continuing with dramas by Alexander Ostrovsky and Ivan Turgenev, and ending with late nineteenth-century/early twentieth century plays by Leo Tolstoy and Anton Chekhov. Some readings from Stanislavsky are also included. This course will be taught in Russian, with some readings in English and others in Russian. HU

RSEE 2225a / HIST 1290a, Russia from the Ninth Century to 1801 Staff
The mainstream of Russian history from the Kievan state to 1801. Political, social, and economic institutions and the transition from Eastern Orthodoxy to the Enlightenment. HU 0 Course cr

* **RSEE 2257a / CPLT 2005a / RUSS 2267a, Memory and Memoir in Russian Culture** Jinyi Chu

How do we remember and forget? How does memory transform into narrative? Why do we read and write memoirs and autobiography? What can they tell us about the past? How do we analyze the roles of the narrator, the author, and the protagonist? How should we understand the ideological tensions between official historiography and personal reminiscences, especially in 20th-century Russia? This course aims to answer these questions through close readings of a few cultural celebrities' memoirs and autobiographical writings that are also widely acknowledged as the best representatives of 20th-century Russian prose. Along the way, we read literary texts in dialogue with theories of memory, historiography, and narratology. Students acquire the theoretical apparatus that enables them to analyze the complex ideas, e.g. cultural memory and trauma, historicity and narrativity, and fiction and non-fiction. Students finish the course with an in-depth knowledge of the major themes of 20th-century Russian history, e.g. empire, revolution, war, Stalinism, and exilic experience, as well as increased skills in the analysis of literary texts. Students with knowledge of Russian are encouraged to read in the original language. All readings are available in English. WR, HU

* **RSEE 2301a, Post-Soviet Civilization** Nari Shelekpayev

The collapse of the Soviet Union stands as the pivotal historical event of the late 20th century, reshaping global politics, economy, and culture. The monolithic Soviet order splintered into wildly divergent paths: some states clawed towards Europe, while others calcified regimes as closed as North Korea's. We trace the genealogy of the Soviet demise and its afterlives until the authoritarian turn of the 2000s, revealing how USSR's legacies shape contemporary world. HU

* **RSEE 2410a / HIST 3240a, Government, Law, and Society in Modern Russia, 1853–1953** Sergei Antonov

Russian political culture from the Crimean War to the death of Stalin. Special attention to continuities, as well as changes, across the revolutionary divide of 1917, and to comparing official policies with daily experiences of ordinary Russians. Changing ideologies and ruling styles of tsars and early Soviet leaders (esp. Lenin, Trotsky, and Stalin) and relations with aristocratic and bureaucratic elites; political dissent and protest, including popular and state-imposed violence; the problem of legality and the rule of law. All discussions and readings in English. WR, HU

RSEE 2660a / HIST 1265a, Soviet Russia 1917–1991 Staff

Overview of the rise and fall of the Soviet Union. Topics include political culture and ideology of the Bolshevik/Communist Party; social and economic changes; foreign policy and the role of WWII; major artistic and cultural movements. Paper assignments involve close readings of memoir and oral history accounts. HU 0 Course cr

* **RSEE 3120a / FILM 3007a / SLAV 3120a and SLAV 6120a / UKRN 3120a and UKRN 6120a, Cinematic Ukraine: Culture, Identity, and Memory** Olha Tytarenko

This course traces the evolution of Ukrainian cinema from the avant-garde experiments of the 1920s to the vibrant post-2014 film resurgence. Exploring themes of national identity, historical memory, and resistance to political and cultural oppression, we analyze how filmmakers have shaped Ukraine's self-conception through film. Topics include the poetic cinema of the 1960s, post-Soviet transition films, and contemporary

works responding to war and cultural sovereignty. Students will engage critically with cinematic language, narrative structures, and visual aesthetics while incorporating perspectives from postcolonial theory and memory studies. The course features guest lectures from Ukrainian film directors and hands-on cinematographic workshops. Weekly thematic units pair films with historical and theoretical readings, offering a dynamic exploration of Ukraine's place in global cinema and cultural history. None HU

* **RSEE 3401a / CPLT 3401a / HUMS 3401a / RUSS 3401a, The Stranger: Travel and Belonging Across Empires** Jinyi Chu and Hana Stankova
How has the "stranger" shaped national and imperial identities? This course considers travel and emigration in imperial contexts and brings Russian literature into conversation with European literature. We explore narratives of imperial exceptionalism, Russian parochialism, and the broader imperial contexts that shaped the world in the 19th and 20th centuries. Through a literary journey from the late 18th century to the mid 20th century, students consider how the Russian literary tradition and national identity were shaped by fraught exchanges between Russians and Western Europeans, as well as by Russia's expansion eastward. We read canonical works by writers who questioned or supported empires and think through ways in which they influenced one another. Through close readings, historicization, and theorization, students gain new perspectives on the issues of belonging and alienation in changing imperial contexts. WR, HU

* **RSEE 4900a and RSEE 4910b, The Senior Essay** Claire Roosien
Preparation of the senior essay under faculty supervision. The essay grade becomes the grade for both terms of the course. Required of all seniors majoring in Russian and East European Studies. Credit for RSEE 490 only on completion of RSEE 491.

Sanskrit (SKRT)

* **SKRT 1100a / LING 1150a, Introductory Sanskrit I** Aleksandar Uskokov
An introduction to Sanskrit language and grammar. Focus on learning to read and translate basic Sanskrit sentences in Devanagari script. No prior background in Sanskrit assumed. L1 1½ Course cr

SKRT 1300a / LING 1380a, Intermediate Sanskrit I Aleksandar Uskokov
The first half of a two-term sequence aimed at helping students develop the skills necessary to read texts written in Sanskrit. Readings include selections from the *Hitopadesa, Kathasaritsagara, Mahabharata,* and *Bhagavadgita.* After SKRT 120 or equivalent. L3

* **SKRT 1500a, Advanced Sanskrit: Readings in Indian Philosophy and Aesthetics** Aleksandar Uskokov
This advanced language course introduces the jargon of the philosophical disciplines (theory of knowledge, metaphysics, philosophy of mind and language, philosophical theology, hermeneutics) and aesthetics in the several systems of learning in ancient and classical India, across the traditions of Hinduism, Buddhism, and Jainism. Additionally, the course introduces topics of philosophical significance in foundational texts such as the Upaniṣads, portions of the *Mahābhārata* and the *Purāṇa*s, and the Buddhist *sūtra* literature. Special attention is given to matters of style, scholastic techniques, and advanced morphology and syntax. The course, thus, combines advanced language instruction with learning intellectual and cultural content, and it facilitates training in

primary research in one of the classical languages of South Asia. Prerequisite: SKRT 140 or equivalent, or instructor permission. L5

Science (SCIE)

*** SCIE 0010a and SCIE 0011b, Perspectives on Biological Research** Sandy Chang
The goal of this two course series is to teach Science, Technology, and Research Scholars 1 (STARS1) scientific skills necessary to conduct cutting-edge undergraduate research in their first summer. During the first semester, students read primary research papers on the COVID19 pandemic and emerge from this course with an appreciation for how rapidly scientific knowledge can be utilized to combat a deadly disease. Students learn how to (1) read the primary scientific literature, (2) present this material to the class and, (3) write a group grant proposal. During the second semester, students are required to take MCDB 201L concurrently and identify a Yale research mentor to work with over the summer. Students learn how to write an independent grant proposal to prepare them for summer research. Students receive guaranteed funding upon successful completion of the grant proposal. Credit for SCIE 010 is given only upon completion of SCIE 011. One course credit, one SC or WR credit, is awarded after successful completion of the grant proposal and one year's work. Enrollment limited to first-year students. Prerequisite: Score of 5 on AP biology test or equivalent on IB biology exam. Students MUST take MCDB 201L, Molecular Biology Laboratory, in Spring 2025 concurrent with SCIE 011. WR, SC ½ Course cr per term

*** SCIE 0020a and SCIE 0021b, Perspectives on Research in the Mathematical and Physical Sciences** Charles Bailyn
This first-year seminar is the first of a two-part sequence designed for students in the Science, Technology and Research Scholars (STARS) program, and other first-year students interesting in studying the physical and mathematical sciences. In the first semester, students encounter on-going research at Yale and in the broader scientific community across physics, astronomy, geology, computer science and data science. Skills necessary to understand, write, and present research in these areas are developed. In the second semester, students identify a Yale research mentor and prepare an independent grant proposal to prepare for summer research. The organizational structures and best practices associated with scientific research are examined. Credit for SCIE 020 is given only upon successful completion of SCIE 021. One course credit, one SC or WR credit, is awarded after successful completion of both courses. Enrollment limited to first-year students. Corequisite: Students must enroll in an appropriate introductory course sequence in Physics or Computer Science. WR, SC ½ Course cr per term

Sinhala (SNHL)

*** SNHL 1100a, Elementary Sinhala I** Staff
First half of a two-term sequence focusing on all four language skills. Basic grammar, sentence construction, simple reading materials, and use of everyday expressions. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L1 RP 1½ Course cr

* **SNHL 1200b, Elementary Sinhala II** Staff
Second half of a two-term sequence focusing on all four language skills. Basic grammar, sentence construction, simple reading materials, and use of everyday expressions. Prerequisite: SNHL 110. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L2 RP 1½ Course cr

SNHL 1300a, Intermediate Sinhala I Staff
Further development of speaking, listening, reading, and writing skills in Sinhala. Communicative approach to the exchange of ideas and information, with early emphasis on oral skills and reading comprehension. Prerequisite: SNHL 120 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail david.ortega@yale.edu for more information. L3 RP 1½ Course cr

* **SNHL 1400b, Intermediate Sinhala II** Staff
Further development of speaking, listening, reading, and writing skills in Sinhala, with a communicative approach to the exchange of ideas and information. Prepares students for the transition to the study of literary Sinhala. Prerequisite: SNHL 130 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail david.ortega@yale.edu for more information. L4 RP 1½ Course cr

SNHL 1500a, Advanced Literary Sinhala I Staff
This course introduces the distinctive grammatical forms and vocabulary used in Literary Sinhala. While focused particularly on the development of reading skills, the course also introduces students to Literary Sinhala composition, builds students' listening comprehension of semi-literary Sinhala forms (such as those used in radio and TV news), and guides students in incorporating elements of the literary register of Sinhala in their spoken production. Prerequisite: SNHL 140, or equivalent. L5 RP

SNHL 1600b, Advanced Literary Sinhala II Staff
As a continuation of SNHL 150, this one-semester course further develops students' comprehension of written Literary Sinhala, expanding their knowledge of the distinctive grammatical forms and vocabulary used. While continuing to focus primarily on reading development, the course also includes elements of Literary Sinhala composition, builds students' listening comprehension of semi-literary Sinhala forms (such as those used in radio and TV news), and guides students in incorporating elements of the literary register of Sinhala in their spoken production. The course incorporates modern texts adapted from recent articles featured in the local Sri Lankan news, and when appropriate, additional Classical Sinhala texts relevant to graduate student research. The course is taught in Sinhala. Prerequisite: SNHL 150, or equivalent. L5 RP

Slavic Languages and Literatures (SLAV)

* **SLAV 1010a / RUSS 2010a, Writing Literature: Doubles, Doppelgängers, and the Boundaries of the Self** Emily Ziffer
In 2024, a BBC article proclaimed that we are "living in the golden age of the doppelgänger." From celebrity lookalike competitions to the threat of AI duplicates in Hollywood, recent media has demonstrated a renewed fascination with the concept of

"the double." In this course, we turn to the rich literary tradition of the "doppelgänger" to examine how writers—from Fyodor Dostoevsky to Kazuo Ishiguro—have engaged with the trope to explore questions of selfhood. We spend the first part of the course considering the theoretical origins of the doppelgänger in gothic literature, turning to concepts of "the self and other" from psychoanalytic, feminist, and postcolonial theory to help us think broadly through the category. In the second part of the course, we read works of literature that feature encounters with a large cast of doppelgänger sub-types, including alter-egos, shadows, ghosts, and evil twins. Finally, we revisit the doppelgänger trope in the digital age to interrogate how advanced technologies have altered the possibilities for "doubling" through innovations such as AI, cloning, and biogenetic de-extinction projects.

* **SLAV 3120a and SLAV 6120a / FILM 3007a / RSEE 3120a / UKRN 3120a and UKRN 6120a, Cinematic Ukraine: Culture, Identity, and Memory** Olha Tytarenko

This course traces the evolution of Ukrainian cinema from the avant-garde experiments of the 1920s to the vibrant post-2014 film resurgence. Exploring themes of national identity, historical memory, and resistance to political and cultural oppression, we analyze how filmmakers have shaped Ukraine's self-conception through film. Topics include the poetic cinema of the 1960s, post-Soviet transition films, and contemporary works responding to war and cultural sovereignty. Students will engage critically with cinematic language, narrative structures, and visual aesthetics while incorporating perspectives from postcolonial theory and memory studies. The course features guest lectures from Ukrainian film directors and hands-on cinematographic workshops. Weekly thematic units pair films with historical and theoretical readings, offering a dynamic exploration of Ukraine's place in global cinema and cultural history. None HU

Sociology (SOCY)

* **SOCY 0074a / ER&M 0581a / MUSI 0081a, Race and Place in British New Wave, K-Pop, and Beyond** Grace Kao

This seminar introduces you to several popular musical genres and explores how they are tied to racial, regional, and national identities. We examine how music is exported via migrants, return migrants, industry professionals, and the nation-state (in the case of Korean Popular Music, or K-Pop). Readings and discussions focus primarily on the British New Wave (from about 1979 to 1985) and K-Pop (1992–present), but we also discuss first-wave reggae, ska, rocksteady from the 1960s–70s, British and American punk rock music (1970s–1980s), the precursors of modern K-Pop, and have a brief discussion of Japanese City Pop. The class focuses mainly on the British New Wave and K-Pop because these two genres of popular music have strong ties to particular geographic areas, but they became or have become extremely popular in other parts of the world. We also investigate the importance of music videos in the development of these genres. Enrollment limited to first year students. SO

SOCY 1012a / AMST 1110a / EDST 1110a, Foundations in Education Studies Staff

Introduction to key issues and debates in the U.S. public education system with a focus on the nexus of education theory and research, policy and pedagogy. The course emphasizes social, scientific, economic, and political forces that shape approaches to

schooling and education reform, and it includes theoretical and practical perspectives from practitioners, policymakers, and scholars. SO o Course cr

SOCY 1283a, Computers, Networks, and Society Scott Boorman
Comparison of major algorithm-centered approaches to the analysis of complex social network and organizational data. Fundamental principles for developing a disciplined and coherent perspective on the effects of modern information technology on societies worldwide. Software warfare and algorithm sabotage; blockmodeling and privacy; legal, ethical, and policy issues. No prior experience with computers required. SO o Course cr

SOCY 1700a / EDST 1144a / EDST 144 / ER&M 2511a / EVST 1144a / EVST 144, Race, Ethnicity, and Immigration Staff
Exploration of sociological studies and theoretical and empirical analyses of race, ethnicity, and immigration, with focus on race relations and racial and ethnic differences in outcomes in contemporary U.S. society (post-1960s). Study of the patterns of educational and labor market outcomes, incarceration, and family formation of whites, blacks (African Americans), Hispanics, and Asian Americans in the United States, as well as immigration patterns and how they affect race and ethnic relations. SO o Course cr

SOCY 1702a / EAST 2721 / GLBL 3303a, Inequality and Social Change in China Emma Zang
This course offers an introduction to major social and economic issues in contemporary China. It provides a survey of the ongoing reforms and the Chinese society in transition with a focus on selected policy issues. In most weeks, the first session is reserved for a lecture by the instructor or a guest lecturer, and the second session is reserved for student-led discussions of pre-circulated questions. SO

SOCY 1704a / AFAM 1986a / LAST 1214a / PLSC 2417a, Contesting Injustice Staff
Exploration of why, when, and how people organize collectively to challenge political, social, and economic injustice. Cross-national comparison of the extent, causes, and consequences of inequality. Analysis of mobilizations for social justice in both U.S. and international settings. Intended primarily for first years and sophomores. SO o Course cr

SOCY 1840b / ANTH 1840b / ER&M 2541b, The Corporation Douglas Rogers
Survey of the rise, diversity, and power of the capitalist corporation in global contexts, with a focus on the 20th and 21st centuries. Topics include: the corporation as legal entity and the social and cultural consequences of this status; corporations in the colonial era; relationships among corporations, states, and non-governmental organizations in Western and non-Western contexts; anti-corporate critique and response; corporate social responsibility; and race, gender, and indigeneity. HU, SO o Course cr

SOCY 2002a / AFAM 1952a / PLSC 2363a, Topics in Contemporary Social Theory Philip Gorski
In-depth introduction to recent developments in social theory, with particular emphasis on the last twenty years. Focus on three distinct areas of study: the building blocks and contrasting understandings of human persons and social action; the competing theories of the social structure of markets, institutions, cultures, social fields, and actor-networks; and the theoretical controversies concerning nations, states and

empires, ethnic and racial identity, and the relation between facts and values in social research. Authors include Judith Butler, Michel Foucault, Jurgen Habermas, Pierre Bourdieu and Bruno Latour. SOCY 151 or equivalent is strongly recommended. WR, SO 0 Course cr

* **SOCY 2009a, The Sociological Imagination** Julia Adams
Introduction to the study of sociology and modernity. Topics include the rise and transformations of capitalism; colonialism and empire; the linked advent of democracy and bureaucracy; the world-historical invention of the individual, and the modern and postmodern city. The course culminates in individualized student final projects, and includes a student-run class blog that discusses readings from classical and contemporary authors. Recommended for sophomores and juniors. SO

* **SOCY 2048a / BENG 2048a, AI, Medicine, and Society** Alka Menon and Xenophon Papademetris
AI has shown tremendous promise to address problems in medicine and science. There is also considerable hype surrounding AI and many concerns (some justified, some not) regarding the use of this type of technology. This discussion-based seminar will 1) provide undergraduate students across disciplines with a broad overview of issues related to AI in medicine at a non-technical level, drawing on perspectives from the interpretive/humanistic social sciences, computing, engineering, and healthcare and 2) model interdisciplinary communication and build a robust framework for collaboration. Overarching topics, grounded in medical case studies, include what it means for computers to "think" and how we understand what they are thinking about; the use and limits of scientific knowledge in making policy decisions; bias, fairness, equity, equality; the challenges of implementation of AI systems; safety and risk; and the human/computer interface. The course also provides a high level overview of machine learning, discussing opportunities, limitations, and tradeoffs. Ultimately, the course offers a grounded look at how AI is being discussed and deployed on the ground in medicine, equipping students with a critical lens for thinking about responsible and practical implementation and innovation when it comes to AI. SO

* **SOCY 2103a, Visual Sociology** Philip Smith
Introduction to themes and methods in visual sociology. The role and use of visual information in social life, including images, objects, settings, and human interactions. Ethnographic photography, the study of media images, maps and diagrams, observation and coding of public settings, unobtrusive measures, and the use of internet resources. SO

* **SOCY 3044a / ER&M 3044a / URBN 3305a, Informal Cities** Leigh-Anna Hidalgo
The informal sector is an integral and growing part of major global cities. With a special focus on the context of U.S. cities, students examine where a burgeoning informality is visible in the region's everyday life. How planners and policymakers address informality is an important social justice challenge. But what is the informal sector, or urban informality, or the informal city? This class addresses such questions through a rigorous examination of the growing body of literature from Sociology, Latinx Studies, Urban Planning, and Geography. We reflect on the debates and theories in the study of informality in the U.S. and beyond and gain an understanding of the prevalence, characteristics, rationale, advantages and disadvantages, and socio-spatial implications of informal cities. More specifically, we examine urban informality in work

—examining street vendors, sex workers, and waste pickers—as well as housing, and the built environment. SO

* **SOCY 3104a / AMST 3304a / ANTH 3304a / ER&M 3304a / HUMS 3304a, Ethnography & Journalism** Madiha Tahir
While each is loathed to admit it, journalism and ethnography are cousins in some respects interested in (albeit distinct) modes of storytelling, translation, and interpretation. This methods course considers these shared grounds to launch a cross-comparative examination. What can the practies of each field and method—journalism and ethnography—tell us about the other? How do journalists and ethnographers engage ideas about the truth? What can they learn from each other? Students spend the first four weeks studying journalistic methods and debates before shifting to ethnographic discussions, and finally, comparative approaches to writing; data and evidence; experience and positionality. HU, SO

* **SOCY 3201a, From Knowledge to Inaction** Rene Almeling
We live in one of the wealthiest countries in the world, and yet there remain millions of Americans who do not have a home, enough food to eat, or access to health care. Academic researchers produce enormous amounts of data and knowledge about social problems like poverty, and yet the poverty rate has remained almost unchanged for fifty years. Likewise, there are reams of historical and social scientific studies about major social problems such as racism, gun violence, abortion access, and climate change. In this seminar, we examine the social processes through which all of this knowledge is ignored by policymakers and others with power to make change. How does increasing knowledge keep resulting in inaction? SO

* **SOCY 3203a / PLSC 3511a, AI for Social Science Methods** Daniel Karell
Social scientists have begun integrating AI technology into the designs and methods of their research projects. How are they doing so? What are the current standards and best practices? This course uses a seminar format to review, discuss, and critique how AI technologies are currently being incorporated into social science research activities. Students read recently published articles and widely discussed unpublished papers, and, through class discussion, identify the promises and pitfalls of using AI to conduct social science research. Students also learn how to justify and explain the use of AI in their own research projects. Prerequisite: The required methods courses in Sociology or Political Science. SO

* **SOCY 3401a, Media and Mass Atrocities in Africa** j. Wahutu
Over the last century, several instances of mass violence have unfolded in numerous parts of the world, the most notable being the Holocaust, the Rwandan Genocide, and ongoing atrocities in Darfur and the Democratic Republic of Congo. How these instances of violence have been represented will form the main body of this class. The study of western news representation of Africa (and the global south) and the dynamics of differential reporting is not new. However, what do we actually know about how African media represent genocide and mass atrocities that occur in Africa? How does the news create and reinforce knowledge about mass atrocities? How can the media both generate and rely on knowledge? Is there a difference between the knowledge produced by African media and media from the global north? These are the questions that will guide us for the semester.

* **SOCY 3433b / ANTH 3821b / MMES 3321b / WGSS 3321b, Middle East Gender Studies** Marcia Inhorn

The lives of women and men in the contemporary Middle East explored through a series of anthropological studies and documentary films. Competing discourses surrounding gender and politics, and the relation of such discourse to actual practices of everyday life. Feminism, Islamism, activism, and human rights; fertility, family, marriage, and sexuality. SO

* **SOCY 3500a, The Sociology of the Sacred** Philip Gorski

The dominant paradigm in the sociology of religion is the theory of secularization. But what if that theory is wrong? What if religion is not so much declining or disappearing as making room for other forms of the sacred, some "spiritual," others "secular," still others somewhere in between? How would that change our understanding of Western modernity and its history? What do we mean by "the sacred"? How do certain times, places, objects, rituals and persons come to be experienced as sacred? How have our understandings of the sacred evolved? And what possibilities—and dangers—arise from the fragmentation of the sacred in modern societies? Some exposure to theories of religion and/or some knowledge of a religious tradition is helpful.

* **SOCY 3707a / WGSS 2271a, Prison Nation, Race, Gender, Crime, and Abolition Politics** Staff

Mass incarceration and police violence are pressing human rights issues in the contemporary Americas. The US carceral state is sweeping, with nearly 2 million people currently incarcerated on any given day and a targeted policing apparatus that brings people under the penal net. At the same time, countries in Latin America have high rates of incarceration and often even higher rates of police violence than the US. These dynamics are deeply racialized and shape individuals, families, and communities. But that is not the full story. Liberatory movements have resisted and surged against this subjugation for decades. In this course, students will comparatively study the development of the contemporary carceral state and the political struggles waged against it. Students will read across the social sciences, Black studies, history, and law, as well as performance, memoir, and testimony. By examining the carceral state in this way, students will gain a critical lens on longstanding debates related to race and racism, justice and injustice, and reparation and abolition, in both the US and Latin America. While the course is not exhaustive, it is meant to equip students with a working framework on the critical debates in the field. This course is not open to students previously enrolled in SOCY 105/WGSS 106. SO

* **SOCY 3741a, Poverty and Social Welfare Policy in the United States** Rourke O'Brien

Formation and effectiveness of anti-poverty policies from a sociological and public policy perspective. Consideration of who is poor and who deserves federal assistance. Topics include: origins of the modern social safety net; the federal government's role in constructing and implementing anti-poverty policy; realities of low-wage work; the "culture of poverty;" and employment- and family-based policy strategies for alleviating poverty. Applied understanding of quantitative social science research methods is helpful, but not required.

* **SOCY 3742a / AFAM 3929a, Managing Blackness in a "White Space"** Elijah Anderson
"White space" is a perceptual category that assumes a particular space to be predominantly white, one where black people are typically unexpected, marginalized when present, and made to feel unwelcome—a space that blacks perceive to be informally "off-limits" to people like them and where on occasion they encounter racialized disrespect and other forms of resistance. This course explores the challenge black people face when managing their lives in this white space. SO

* **SOCY 3843a / ER&M 3083a, Central Americans in the U.S.** Leigh-Anna Hidalgo and Katy Maldonado Dominguez
This course is an interdisciplinary survey of the social, historical, political, economic, educational, and cultural experiences of Central American immigrants and their children in the United States. The primary objective of the course is to introduce students to several contemporary experiences and issues in the U.S. Central American community. Focusing mostly on Guatemalan, Honduran, and Salvadoran immigrants—the three largest groups in the United States—we explore the social structures that constrain individuals as well as the strategies and behaviors immigrants and their communities have taken to establish their presence and make a home in U.S. society and stay connected to their countries of origin. Students gain a critical understanding of Central American identities, particularly as these have been constructed through the intersection of race, ethnicity, gender, sexuality, and legal status. SO

* **SOCY 4100a, Senior Essay and Colloquium for Nonintensive Majors** Yuan Hsiao
Independent library-based research under faculty supervision. To register for this course, students must submit a written plan of study approved by a faculty adviser to the director of undergraduate studies no later than the end of registration period in the term in which the senior essay is to be written. The course meets biweekly, beginning in the first week of the term.

* **SOCY 4200a, Senior Essay and Colloquium for Intensive Majors** Alex Manning
Independent research under faculty direction, involving empirical research and resulting in a substantial paper. Workshop meets biweekly to discuss various stages of the research process and to share experiences in gathering and analyzing data. The first meeting is in the second week of the term.

* **SOCY 4701a, Individual Study** Jonathan Wyrtzen
Individual study for qualified juniors and seniors under faculty supervision. To register for this course, each student must submit to the director of undergraduate studies a written plan of study that has been approved by a faculty adviser.

South Asian Studies (SAST)

SAST 2610a / HUMS 4501a / PHIL 1118a / RLST 1270a, Buddhist Thought: The Foundations Staff
This class introduces the fundamentals of Buddhist thought, focusing on the foundational doctrinal, philosophical, and ethical ideas that have animated the Buddhist tradition from its earliest days in India 2500 years ago down to the present, in places such as Tibet, China, and Japan. Though there will be occasional discussion of the social and practical contexts of the Buddhist religion, the primary focus of this course lies on how traditional Buddhist thinkers conceptualize the universe, think about the

nature of human beings, and propose that people should live their lives. Our main objects of inquiry are therefore the foundational Buddhist ideas, and the classic texts in which those ideas are put forth and defended, that are broadly speaking shared by all traditions of Buddhism. In the later part of the course, we take up some of these issues in the context of specific, regional forms of Buddhism, and watch some films that provide glimpses of Buddhist religious life on the ground. HU o Course cr

* **SAST 2620a / AMST 3303a / EP&E 247 / ER&M 3530a / FILM 2980a, Digital War** Madiha Tahir

From drones and autonomous robots to algorithmic warfare, virtual war gaming, and data mining, digital war has become a key pressing issue of our times and an emerging field of study. This course provides a critical overview of digital war, understood as the relationship between war and digital technologies. Modern warfare has been shaped by digital technologies, but the latter have also been conditioned through modern conflict: DARPA (the research arm of the US Department of Defense), for instance, has innovated aspects of everything from GPS, to stealth technology, personal computing, and the Internet. Shifting beyond a sole focus on technology and its makers, this class situates the historical antecedents and present of digital war within colonialism and imperialism. We will investigate the entanglements between technology, empire, and war, and examine how digital war—also sometimes understood as virtual or remote war—has both shaped the lives of the targeted and been conditioned by imperial ventures. We will consider visual media, fiction, art, and other works alongside scholarly texts to develop a multidiscpinary perspective on the past, present, and future of digital war. none HU, SO

* **SAST 2690a / HUMS 4598 / PHIL 4474 / RLST 2820a, Philosopher Queens of Hinduism and Buddhism** Sonam Kachru

Inspired by the bestselling book *The Philosopher Queens*, this course seeks to make cognitive room for women in the history of Indian (and Indian Buddhist) philosophy, and to reflect on what making such room involves: we explore the arguments and concerns of neglected figures—some human (like Nanduttara or Lalleshwari), some not; some historical (Laksmikaradevi), some not—and explore philosophical concerns involved in the reconstruction of their voices and views. HU

* **SAST 3030a / ANTH 4883a, In Ordinary Fashion** Jane Lynch

Clothing fashions not only our bodies but also our experiences in and claims about the world. It has been used to define the nature and radical possibilities of indigeneity, anti-colonial nationalism, counter-cultural narratives, and capitalist critiques. At the same time, dress—and its social and legal regulation—also creates and reinforces social hierarchies, systems of morality, and forms of exclusion. This course centers these competing social realities and histories using clothing as a way into understanding the poetics and politics of everyday life. Readings include ethnographies and social histories of textiles, fashion, and the manufacture of garments including cases from India, Guatemala, Italy, China, Sri Lanka, Bangladesh, Trinidad, and the United States. SO

* **SAST 3040b / ANTH 3858b, Corporations & Communities** Jane Lynch

Can communities redefine corporations? How do corporations shape everyday life? To whom are they responsible? This course examines the relationship between commerce, society, and culture through a diverse set of case studies that are rooted in both global and local histories. Students learn about Henry Ford's rubber plantations

in the Amazon, family firms in Italy, how the East India Company shaped the modern multinational, the first company town to be established and run by an Indian firm, transnational "stakeholder" arrangements to compensate injured garment workers in Bangladesh, and the rise of "corporate social responsibility" culture. The goal of this course is not to define the relationship between corporations and communities as singular or obvious, but rather, to draw out the variety of factors—economic, historical, social, and cultural—that shape commercial interactions, institutional cultures, and claims about market ethics and social responsibility. HU, SO

* **SAST 3340a / ER&M 3633a / HIST 3463a, Mobile South Asians and the Global Legal Order** Rohit De

South Asians make up the largest population of overseas migrants in the world, close to 33 million in 2017 and a diaspora that is almost double that number. This course looks at the unprecedented mobility of South Asians from the mid-19th century until now as merchants, indentured labor, students, pilgrims, professionals, domestic workers, political exiles, refugees, and economic migrants, through the lens of state attempts to control movement and individual resistance, subversion, and adaptation to such controls. Focusing on the legal consciousness of South Asian migrants and the emergence of South Asian nations as political players on the global stage, this class traces how South Asian mobility led to the forging of a new global order, over migration, multiculturalism, Islamic law, civil liberties, labor law, and international law. WR, HU

* **SAST 3450a / GLBL 226 / PLSC 3108a, National Security in India in the Twenty-first Century** Sushant Singh

This course examines the state and dynamics of national security in India in the past two decades. As an emergent power, India is an important country in Asia, with its economic and geo-political strength noticed globally. A major share of the country's heft comes from its national security paradigm which has undergone a significant shift in the twenty-first century. This course intends to take a holistic look at the conceptions for the basis of India's national security, its evolution, the current challenges and its future course by exploring its various dimensions such as China, Pakistan, global powers, Indian Ocean region, Kashmir, nuclear weapons, civil-military relations and defense preparedness. SO

* **SAST 3640a / HIST 3415a / HSHM 4740a, Health, Medicine and Science in Modern South Asia** Gourav Krishna Nandi

In this seminar, we explore health, medicine, and science in South Asia during the 19th and 20th centuries, and examine how networks and circulations of medical knowledge, local and transnational actors, and anticolonial physicians and scientists shaped colonial modernities and postcolonial nationalism in the region. In the first part, we examine the establishment of colonial medicine in British India, colonial interventions during plague visitations, and approaches to famine and food in the 19th century. We explore how science in colonial India was intertwined with anticolonialism, and examine anticolonial arguments against famines using modern economic sciences. In the second part, we explore pluralist practices of medicine in colonial South Asia and analyze how diverse approaches of colonial Indian medical practitioners blur the categories of "traditional" and "modern" medicine. We then focus on colonial and postcolonial public health interventions—including, regulating poisons and adulterated food, population control, and vaccination campaigns—and their contestations. In the final

part, we focus on the postcolonial state and explore how scientific nationalism shaped the postcolonial state's approaches to modernization and development. We examine how Indian physicists and surgeons created and maintained knowledge networks using alliances on both sides of Cold War rivalries. WR, HU

* **SAST 3760a / ANTH 2252a / RLST 3300a, Religion, Place, and Space** Harini Kumar
This seminar explores why 'placemaking' is significant for practitioners of various religions worldwide. From the holy city of Mecca to the sacred landscape of Banaras in India, religious traditions are tethered to sacred geographies. These locations are often physical sites imbued with sacred energies and social meaning. Religious activities can occur in churches or mosques, forests or mountains, community centers, public squares, or homes. The course materials consider specific religious sites and contexts (including those on the Yale campus), examining how these places simultaneously become sites of worship, articulations of identity and heritage, claims of political significance, and hubs of social and emotional life. Special attention is given to how space and place are gendered, racialized, and shaped by emotions, senses, and memories. HU, SO

* **SAST 3830b / ANTH 3873b, Water and Society: Culture, Life, and Values** Staff
Water has become an urgent theme not just in current anthropology, but in development studies and environmental studies more generally. Beyond questions of scarcity and sustainability, water allows human life to flourish, and without water, there would be no civilization. Yet water is not equitably distributed across time or space, leading to contestation and conflict around water. Against such a background of strife, this course examines how human beings have related to water, to other life forms, and to each other through the control of water, in different historical moments and different parts of the world. The seminar is organized around four porous thematic clusters: (i) "urban water", to do with cities and urban industrial life; (ii) "agrarian water", to do with rivers, irrigation systems, and agrarian life; (iii) "rural water", to do with coasts, lakes, dams and rural life; and (iv) and "living water", to do with social, cultural and political values, and human and more-than-human life. This seminar introduces students to the everyday values of water, as well as the everyday politics of water, including the production of water and its attendant politics at the level of the nation-state as well as the city municipality while also being attentive to the moral ecologies of water. By studying water in different ways through the lens of culture, environment, social justice, and spirituality or faith, students develop a nuanced understanding of development, urbanization, environmental justice, and climate change. HU, SO

* **SAST 4860a, Directed Study** Jane Lynch
A one-credit, single-term course on topics not covered in regular offerings. To apply for admission, a student should present a course description and syllabus to the director of undergraduate studies, along with written approval from the faculty member who will direct the study.

Spanish (SPAN)

* **SPAN 0560a, First-Year Colloquium: Literary Studies in Spanish** Noel Valis
Introduction to the study of literature in general and to some of the most important texts in Hispanic literature. Selected texts in Spanish include short stories, novels, lyric,

and theater. Open to students who have placed into L5 courses. Counts toward the requirements of the Spanish major. Enrollment limited to first-year students. L5, HU

* **SPAN 1100a, Elementary Spanish I** Staff
For students who wish to begin study of the Spanish language. Development of basic skills in understanding, speaking, reading, and writing through a functional approach to the teaching of Spanish grammar. Includes an introduction to the cultures (traditions, art, literature, music) of the Spanish-speaking world. Audiovisual materials are incorporated into class sessions. Conducted in Spanish. To be followed immediately by SPAN 120. L1 1½ Course cr

SPAN 1200a, Elementary Spanish II Staff
Further development of understanding, speaking, reading, and writing skills. Class sessions incorporate short authentic texts in Spanish, audiovisual materials, and film. Cultural topics of the Spanish-speaking world (traditions, art, literature, music) are included. Conducted in Spanish. After SPAN 110 or in accordance with placement results. Admits to SPAN 130 or 145. L2 1½ Course cr

* **SPAN 1250a, Intensive Elementary Spanish** Lourdes Sabé
An intensive beginning course in spoken and written Spanish that covers the material of SPAN 110 and 120 in one term. Conducted in Spanish. Admits to SPAN 130 or 145. Not open to students who have completed SPAN 110 or 120. L1, L2 RP 2 Course cr

SPAN 1300a, Intermediate Spanish I Staff
Development of language proficiency in listening, speaking, reading, and writing through communicative activities rather than a sequence of linguistic units. Authentic Spanish language texts, films, and videos serve as the basis for the functional study of grammar and the acquisition of a broader vocabulary. Cultural topics are presented throughout the term. Prerequisites: Conducted in Spanish. Admits to SPAN 140. L3 1½ Course cr

SPAN 1400a, Intermediate Spanish II Staff
Continuation of SPAN 130. Development of increased proficiency in the four language skills. Greater precision in grammar usage, vocabulary enrichment, and expanded cultural awareness are achieved through communicative activities based on authentic Spanish-language texts, including a short novel. Conducted in Spanish. Admits to L5 courses. L4 1½ Course cr

* **SPAN 1500a, Spanish for Heritage Speakers** Noelia Sánchez Walker
SPAN 142 is exclusively designed for Spanish heritage language speakers. In this course, we analyze a wide array of compelling multimodal texts and genres (e.g., visual arts, music, film, literature, mythological narratives) to shed light on and celebrate the cultural productions and worldviews of four communities at the center of contemporary discussions pertaining to social justice and representation in Latin America and Latinx USA: women, indigenous communities, Afro-Latinos/as, and immigrants. The tasks and projects created around these texts will further advance your literacy and your command of mechanical aspects of the language while fostering a deeper understanding of various cultures in the Spanish-speaking world. After SPAN 130 or in accordance with placement results. L4 1½ Course cr

* **SPAN 2010a, Policies and Politics in the Spanish-Speaking World** María Pilar Asensio-Manrique
This course is a content-based course that looks to further increase your language proficiency and critical cultural awareness by engaging you with a wide array of compelling texts and media (e.g., legal texts, journalistic and opinion pieces, film, podcasts, literature) from various communities in Latin America and Spain. Through critical analyses of these texts and media, as well as through conversations with native speakers of Spanish in different countries, this course gives you an insider's perspective of some of the most pressing political, social, and cultural issues in the Spanish-speaking world today. This course is organized into the following 4 thematic units: local perspectives from Latin American & Spanish cities; when quality education speaks a minority/minoritized language; healthcare as culture, healthcare as right; and let us write a Latin American constitution for all. Prerequisite: SPAN 140 or SPAN 142 or SPAN 145 or L5 placement L5

* **SPAN 2015a, Spanish Language and Culture through Art** Rosamaria Leon
An advanced course designed to increase student's fluency in oral and written skills. Through the exploration of five art themes relevant to Spanish speaking countries, students review advanced points of Spanish grammar, focus on vocabulary enrichment, and learn the basic principles of academic composition. The course approach for learning is a project-based model which introduces a wide variety of texts: readings, visual art, podcast, music, videos. Students are required to register for a recitacion practice that consists of a weekly 40-minute conversation with students from Pontificia Universidad Católica del Perú. Prerequisite: AP with score of 5/ IB score of 7, Placement in L5 through Spanish Department placement exam or by having completed L4. L5, HU

* **SPAN 2020a / LAST 2223a, Spanish in Film: An Introduction to the New Latin American Cinema** Staff
Development of proficiency in Spanish through analysis of critically acclaimed Latin American films. Includes basic vocabulary of film criticism in Spanish as well as discussion and language exercises. Enrollment limited to 18. L5

* **SPAN 2040a, Languaging in Latino America** Jorge Méndez-Seijas
This interdisciplinary seminar explores the dynamic nature of the languages and identities that shape and are shaped by Latino communities in the United States. Critical sociolinguistics, literature, art, history, and politics are some of the disciplines that guide our discussions as we try to better understand how different groups of Latinos/as have developed some of their linguistic and cultural products, practices, and perspectives. While engaging with the intricacies of language use, identity, and power dynamics in Latino America, this course seamlessly integrates a series of activities and assignments intended to help students hone their knowledge of Spanish while further expanding their multiple literacies. Prerequisite: SPAN 1400, SPAN 1450, SPAN 1500, or L5 placement. L5, HU

* **SPAN 2050a / LAST 2222a, Legal Spanish** Mercedes Carreras
An introduction to Spanish and Latin American legal culture with a focus on the specific traits of legal language and on the development of advanced language competence. Issues such as human rights, the death penalty, the jury, contracts, statutory instruments, and rulings by the constitutional courts are explored through law journal articles, newspapers, the media, and mock trials. Enrollment limited to 18.

A maximum of one course in the 200-230 range may count as an elective toward the Spanish major. L5

SPAN 2090a / FILM 2167a / LAST 2165a / PORT 2165a / WGSS 2165a, Through the Lens of Memory: Other Perspectives on Dictatorships in Latin America and Iberia Giseli Tordin

This course examines the cinematic portrayals of military dictatorships in Brazil, Argentina, Chile, Spain, and Portugal, exploring how film serves as both a historical document and a means to reinterpret and reconstruct the past. As a language course, it allows students to engage with multiple modes of meaning—linguistic, visual, auditory, tactile, gestural, and spatial—through which cinema conveys its narratives. Students analyze how films reconstruct memory, challenge hegemonic historiography, and reinscribe erased or silenced perspectives. The course reflects on the relevance of these works in contemporary struggles against violence and oppression, considering how they teach us to critically engage with power, resistance, and collective memory. It also focuses on women's cinematic productions and representations, examining how gender, race, and political resistance intersect in the visual representation of repression, violence, and memory. The course incorporates both Spanish and Portuguese, encouraging students to express their ideas and develop projects in either language. Languages: Portuguese and Spanish. Prerequisite: PORT 1400 (or equivalent) or SPAN 1400 (or equivalent). L5, HU

*** SPAN 2100a / LAST 2227a, Creative Writing** Mayte López

An introduction to the writing of fiction, poetry, and creative nonfiction, with a focus on developing techniques and abilities that are essential for crafting imaginative texts and honing self-expression. Through in-class tasks, substantive discussions on composition and craft, and analyses of contemporary Latinx, Latin American, and Spanish works, students enhance their writing skills and nurture their unique voices as writers. This course takes on the format of a workshop, with students receiving constructive feedback from both the instructor and their fellow writers. Conducted in Spanish. Enrollment limited to 15. A maximum of one course in the 200–230 range may count as an elective toward the Spanish major. L5, HU

SPAN 2145a / ER&M 1678a / LAST 2228a, Borders & Globalization in Hispanophone Cultures Luna Najera

The borders that constitute the geographical divisions of the world are contingent, but they can have enormous ordering power in the lives of people and other beings. Human-made borders can both allow and disallow the flow of people and resources (including goods, knowledge, information, technologies, etc.). Like geographical borders, social borders such as race, caste, class, and gender can form and perpetuate privileged categories of humans that constrain the access of excluded persons to resources, education, security, and social mobility. Thus, bordering can differentially value human lives. Working with the premise that borders are sites of power, in this course we study bordering and debordering practices in the Hispanic cultures of Iberia, Latin America, and North America, from the 1490s to the present. Through analyses of a wide range of texts that may include treatises, maps, travel literature, visual culture, material culture (e.g., currency), law, music, and performance art, students investigate the multiple ways in which social, cultural, and spatial borders are initiated, expressed, materialized, and contested. More broadly, we explore, describe, and trace the entanglements of bordering, globalizations, and knowledge production

in Hispanophone cultures. Some of the questions that will guide our conversations are: What are (social) borders and what are the processes through which they persist? How do the effects of practices that transcend borders (e.g., environmental pollution, deforestation) change our understanding of borders? What can we learn from indigenous peoples' responses to bordering process and globalization? Prerequisite: SPAN 140 or 145, or in accordance with placement results. The course is conducted entirely in Spanish. Readings are available electronically through Canvas and the University Library. To be conducted in Spanish. L5, HU

* **SPAN 2155a / EVST 2232a, Ecological Mindfulness: Poetics and Praxis in the Spanish-Speaking World** Sarah Glenski

What is our relationship with nature? What constitutes ecological mindfulness? Does the practice of ecological mindfulness constitute a poetics? Is art a form of ecological mindfulness? These are some of the questions that we consider as we examine the concept of ecological mindfulness as an intersection of poetics and praxis. Throughout the semester, we explore a wide array of artistic expressions (essays, short stories, sound, poetry, photography, painting, etc.), which allows us to both appreciate and interrogate the many ways in which interactions with nature are depicted and performed in different Hispanophone cultures. Our analysis of these texts is complemented by carrying out and reflecting upon our own practice of ecological mindfulness. This course is taught in Spanish. Prerequisite: SPAN 140, or SPAN 142, or SPAN 145, or equivalent L5, HU

* **SPAN 2200a, Cultural Inquiries: Spain, Latin America, and the Latinx World** Olivia Lott

This course offers an in-depth exploration of the cultural landscapes of Latin America, Spain, and the Latinx world, providing students with specialized terminology and methodologies essential for studying cultural production. Organized around four thematic modules, students engage with a variety of cultural forms, including literature, film, and visual art, spanning different historical periods and geographical regions. This course is mandatory for Spanish majors, bridging previous language and culture courses with advanced levels of study. HU

* **SPAN 2310a / LAST 2266a, Critical Contexts in Colonial Latin America** Lisa Voigt

This course offers a panoramic introduction to the written and visual cultural production of colonial Latin America (ca. 1492–1800). Organized chronologically and guided by the methodology of close reading, we analyze works of various genres and formats whose creators were of Indigenous, African, Spanish, and mestizo descent. We investigate how these texts reveal, critique, reimagine, or participate in the power relations of multiethnic societies founded on conquest, colonization, and slavery. Among our objectives is the development of the skills of critical analysis of texts written in Spanish, which we pursue through class discussion, oral presentations, and written and creative projects. L5, HU

* **SPAN 2510a / LAST 2261a, Critical Contexts in Medieval and Early Modern Iberia** Jesus Velasco

This course offers a panoramic introduction to Iberian written cultures from the medieval to early modern period (ca. 800–1700). Organized chronologically and guided by the methodology of close reading, we will analyze a wide range of concepts and topics relevant for understanding the multilingual, multireligious contexts in which literary and non-literary works were produced, including knowledge and hospitality;

borders and negotiation; authority and power; autobiography and eyewitness narrative accounts; courtly love and love sickness; makeup and cosmetic theory; prostitution and public health; gender dissidence and transgressive bodies; masculinities and misogyny; economic crisis and decline; black Africans and the African diaspora; the Inquisition and religious orthodoxy. Open to students who have placed into L5 courses or who have successfully completed an L4 course in Spanish. Counts toward the major in Spanish. L5, HU

* **SPAN 3385a / CPLT 3385a, Hemispheric Poetics & Politics** Olivia Lott
This course offers a survey of hemispheric poetics and politics. We examine pivotal moments of US-Latin American history and their subsequent representation or interrogation in Latin American and US Latinx poetry. We cover much of the 20th and 21st centuries, including the so-called Banana Wars, the disintegration of the Good Neighbor era, the inter-American Cold War, US-backed dictatorships and occupations, the neoliberal national security complex, and how these foreign policies "come home." Writing in real time or decades later, we consider how poets "sing," witness, document, confront, or denaturalize these hemispheric realities, write in tension or collaboration with others across borders, and create transformative knowledges that allows us to see—and read—the American hemisphere differently. We aim to cultivate a South-to-North comparative approach, centering Latin American and US Latinx poets, and Spanish-language poetic accounts of these hemispheric encounters. Taught in Spanish. Prerequisites: Open to students who have placed into L5 courses or who have successfully completed an L4 course in Spanish. Counts toward the Spanish major. First-year students will not be admitted into the course. L5, HU

* **SPAN 3525a / WGSS 4403a, Women Writers of Spain** Noel Valis
The development of women's writing in Spain, with a focus on the modern era. Equal attention to the sociohistorical and cultural contexts of women writers and to the narrative and poetic strategies the authors employed. Some readings from critical and theoretical works. L5, HU

* **SPAN 3565a / CPLT 3565a / PORT 3230a / TDPS 3051a, Staging Early Iberian Drama** Nicholas Jones
This course examines the construction and representation of class, gender, power, race, and sexuality in early Iberian drama. Taking a chronological frame, we cover these themes beginning with medieval Iberian pageantry and ending with the works of Pedro Calderón de la Barca and Sor Juana Inés de la Cruz. To guide and nuance our class discussions and readings, we interrogate the staging and performance of class, gender, race, and sexuality along the lines of: courtly and civic coronations, pageantry, and tournaments; the Renaissance underworld of *La Celestina*; the short-skit interludes of Lope de Rueda; Lope de Vega and the *comedia nueva*; African dances and blackface performance; cross-dressing and gender dissidence in Tirso de Molina and Sor Juana; queer readings of Agustín Moreto's *El lindo Don Diego*; celebrity and the stardom of actors; clothing, cosmetics, and stage props; and, architecture, urban space and cities. L5, HU

* **SPAN 3570a, Revolutionary Barcelona** Aurelie Vialette
This course explores the many facets of Barcelona, a city through which students can understand social tensions, working-class revolts, Spain's civil war and the legacies of slavery in today's world. L5, HU

* **SPAN 4600a / ER&M 3592a / HSAR 4492a, Visual Encounters in the Early Modern Atlantic** Catalina Ospina and Lisa Voigt

This course examines the visual, material, and human flows that connected Africa, Europe, and the Americas between 1450 and 1850 and gave its contours to the early modern Atlantic World. Students explore the role of the visual in key institutions and phenomena that emerged in the circum-Atlantic and continue to cast their long shadow over the contemporary world. Topics include: colonialism, the slave trade, blackness and indigeneity, scientific exploration, religious encounters, and revolt. HU

* **SPAN 4605a / LAST 2605a, Pacific Bridges: Asian Diasporas Across Latin America** Inês Forjaz de Lacerda and Anibal González-Pérez

What do Borges and Bashō have in common? Why is K-Pop so popular in places like Chile and Brazil? And what can *Shōgun* teach us about the world? In this course, we dive into the unexpected connections between Asia and Latin America, tracing stories of migration, cultural fusion, and artistic exchange from colonial encounters to today's global pop culture. Our travels take us from early modern Japan, India, and the Philippines to today's Cuba, Brazil, Peru, and Argentina, with several other stops along the way. Through literature, film, music, and anime, we explore how Asian diasporas shaped, and were shaped by, the Spanish- and Portuguese-speaking worlds. Readings include Jorge Luis Borges, Cristina García, Chen Li, Augusto Higa Oshiro, Octavio Paz, Adriana Lisboa, and José Watanabe, among others. All materials are in English, with optional readings in Spanish and Portuguese for those interested in the original texts. Taught in English.

* **SPAN 4610a / RLST 3400a, The World(ing) of Tarot** Todne Thomas and Nicholas Jones

This course takes an interdisciplinary approach to the exploration of tarot. It joins together religious studies, social scientific, historical, and aesthetic approaches to teach about contexts of practice, genealogies of tarot phenomena, and their visuality. It establishes a foundational knowledge of tarot by exploring popular culture (mis)representations, tracing its longstanding eclectic history, and studying its archetypes. Conceptually, the course uses tarot as an avenue to discuss conceptual themes of materiality and aesthetics, esotericism, politics, gender, culture, and worlding. Through this guided study of tarot, we explore tarot's enduring, yet contested appeal and relativize Western epistemologies, including that of the academy itself.

* **SPAN 4618b / ANTH 4818b / ER&M 4518b and ER&M 6606b / WGSS 4518b, Multi-Sited Ethnography: Trans-Atlantic Port Cities in Colombia and Spain** Eda Pepi and Ana Ramos-Zayas

Critical to colonial, imperial, and capitalist expansion, the Atlantic offers a dynamic setting for adapting ethnographic practices to address questions around interconnected oppressions, revolts, and revolutions that are foundational to global modernity. Anchored in a Spanish and a Colombian port city, this course engages trans-Atlantic 'worlding' through a multi-sited and historically grounded ethnographic lens. Las Palmas—the earliest mid-Atlantic port and Europe's first settler colony in Africa—and Cartagena—once the principal gateway connecting Spain and its American empire—illuminate urgent contemporary issues such as climate, displacement, inter-regional subjectivities, and commerce. During a spring recess field experience (March 8–16, 2026), students immerse themselves for four nights each in Las Palmas and Cartagena,

developing critical "tracking" skills that bridge ethnographic practice with cultural theory. Preparation for fieldwork includes an on-campus curriculum, organized around Cartagena and Las Palmas, and sessions with Yale Ethnography Hub faculty, covering different methodologies. As part of this broader programming, the curriculum delves into trans-Atlantic migrations from the Middle East, South Asia, and Africa that have transformed port cities, labor and aesthetic practices, class-making racial formations, and global geopolitics. After recess, the course shifts toward independent work, as students synthesize field-collected data and insights into a collaborative multimodal group project and individual ethnographic papers. Interested students must apply by November 1st via the course website. Students may withdraw by the university deadlines in April. Prerequisite: Conversational and reading proficiency in Spanish. Readings are in English and Spanish, with assignments accepted in either language. HU

* **SPAN 4900a, The Senior Project** Aurelie Vialette
A research project completed under faculty supervision and resulting in an essay of considerable length, or its equivalent in another medium, in Spanish.

* **SPAN 4903a, Directed Readings and/or Individual Research** Aurelie Vialette
Individual study under faculty supervision. The student must submit a bibliography and a written plan of study approved by the faculty adviser to the director of undergraduate studies. No reading or research course credit is granted without prior approval from the director of undergraduate studies. The student must meet with the instructor at least one hour a week. A final examination or essay is required.

Special Divisional Major (SPEC)

Statistics and Data Science (S&DS)

S&DS 1000a or b, Introductory Statistics Ethan Meyers
An introduction to statistical reasoning. Topics include numerical and graphical summaries of data, data acquisition and experimental design, probability, hypothesis testing, confidence intervals, correlation, regression, multiple regression, and ANOVA. Application of statistical concepts to data; analysis of real-world problems. A basic introduction to the R programming language. May not be taken after S&DS 1080 or 1090. QR

S&DS 1080a, Introduction to Statistics: Advanced Fundamentals Jonathan Reuning-Scherer
Introductory statistical concepts beyond those covered in high school AP statistics. Includes additional concepts in regression, an introduction to multiple regression, and ANOVA. This course is intended as a bridge between AP statistics and courses such as S&DS 2300, Data Exploration and Analysis. Meets for the second half of the term only. Prerequisites: A previous statistics course in high school. May not be taken after S&DS 1000 or any other full semester Yale introductory statistics courses. Students should take S&DS 1000 rather than S&DS 1080, 1090. ½ Course cr

S&DS 1090a, Introduction to Statistics: Fundamentals Jonathan Reuning-Scherer
General concepts and methods in statistics. Covers material equivalent to high school AP statistics. Meets for the first half of the term only. May not be taken after or

concurrently with S&DS 1000 or any other full semester Yale introductory statistics courses. ½ Course cr

S&DS 1230a or b / CPSC 1230a or b / PLSC 3508a or b / S&DS 5230a or b, YData: An Introduction to Data Science Staff

Computational, programming, and statistical skills are no longer optional in our increasingly data-driven world; these skills are essential for opening doors to manifold research and career opportunities. This course aims to dramatically enhance knowledge and capabilities in fundamental ideas and skills in data science, especially computational and programming skills along with inferential thinking. YData is an introduction to Data Science that emphasizes the development of these skills while providing opportunities for hands-on experience and practice. YData is accessible to students with little or no background in computing, programming, or statistics, but is also engaging for more technically oriented students through extensive use of examples and hands-on data analysis. Python 3, a popular and widely used computing language, is the language used in this course. The computing materials will be hosted on a special purpose web server. QR

* **S&DS 1720a / EP&E 328 / EP&E 4328a / PLSC 2509a, YData: Data Science for Political Campaigns** Joshua Kalla

Political campaigns have become increasingly data driven. Data science is used to inform where campaigns compete, which messages they use, how they deliver them, and among which voters. In this course, we explore how data science is being used to design winning campaigns. Students gain an understanding of what data is available to campaigns, how campaigns use this data to identify supporters, and the use of experiments in campaigns. This course provides students with an introduction to political campaigns, an introduction to data science tools necessary for studying politics, and opportunities to practice the data science skills presented in S&DS 123, YData.

QR

* **S&DS 1730b, YData: Analysis of Baseball Data** Ethan Meyers

The fields of data science aim to extract insights from large data sets that often contain random variation. Baseball is a game that contains a high degree of randomness, and because professional baseball has been played since the 19th century, a large amount of data has been collected about players' performance. In this class we use baseball data to understand key concepts in data science including data visualization, data wrangling, and statistical inference. To understand these concepts, we analyze data include season-level statistics going back to the 1870's, play-by-play statistics going back to the 1930's and pitch trajectory statistics going back to 2006. The course uses the Python programming language and is paced to be accessible to students who have previously taken or are currently enrolled in S&DS 123. QR

* **S&DS 1790a, Data Science Applications in Insurance** Perry Beaumont

The insurance industry is becoming increasingly data driven. Data Science can be used to inform where new market opportunities are emerging, where risks are growing, how insurance policies can be more optimally structured, and ways claims can be more meaningfully managed. In exploration of these topics, flood insurance claims maintained by the Federal Emergency Management Agency (FEMA) and available in a data set with over 2.6 million rows and 40 data fields, serve as a north star in our analytic journey. We address issues that can arise when working with real-world data

collection, along with related strategies for handling data that may be incomplete or simply messy. This course provides opportunities for students to extend the data science skills acquired in computationally-oriented introductory statistics courses, using new applications relevant to the financial services industry. The data science skills presented in a computationally oriented introductory course (S&DS 123, 220, or 230), and previous use of R are suggested. QR

S&DS 2200b, Introductory Statistics, Intensive Robert Wooster
Introduction to statistical reasoning for students with particular interest in data science and computing. Using the R language, topics include exploratory data analysis, probability, hypothesis testing, confidence intervals, regression, statistical modeling, and simulation. Computing taught and used extensively, as well as application of statistical concepts to analysis of real-world data science problems. MATH 115 is helpful but not required. While no particular prior experience in computing is required, strong motivation to practice and learn computing are desirable. QR

* **S&DS 2240a, Dice, Data, and Decisions—The Statistics of Board Game Strategy** Robert Wooster
This course provides a hands-on application of data analysis, simulation, and probability theory to the world of board games and traditional games of chance. Class lessons will be a combination of lecture, computing labs, and actually learning and playing games! Topics include analyzing board game strategy using probability theory, probabilistic modeling using simulation in R, and exploration and analysis of both simulated and real game board game data. One of S&DS 100, 123, 220, or 230, and experience in the R statistical programming language. QR

S&DS 2300a or b, Data Exploration and Analysis Jonathan Reuning-Scherer
Survey of statistical methods: plots, transformations, regression, analysis of variance, clustering, principal components, contingency tables, and time series analysis. The R computing language and Web data sources are used. Prerequisite: a 100-level Statistics course or equivalent, or with permission of instructor. QR

S&DS 2380a, Probability and Bayesian Statistics Robert Wooster
Fundamental principles and techniques of probabilistic thinking, statistical modeling, and data analysis. Essentials of probability, including conditional probability, random variables, distributions, law of large numbers, central limit theorem, and Markov chains. Statistical inference with emphasis on the Bayesian approach: parameter estimation, likelihood, prior and posterior distributions, Bayesian inference using Markov chain Monte Carlo. Introduction to regression and linear models. Computers are used for calculations, simulations, and analysis of data. After or concurrently with MATH 118 or 120. QR

S&DS 2400b, An Introduction to Probability Theory Robert Wooster
Introduction to probability theory. Topics include probability spaces, random variables, expectations and probabilities, conditional probability, independence, discrete and continuous distributions, central limit theorem, Markov chains, and probabilistic modeling. This course counts towards the Data Science certificate but not the Statistics and Data Science major. Prerequisite: MATH 115. QR

S&DS 2410a / MATH 2410a, Probability Theory Sinho Chewi
Introduction to probability theory. Topics include probability spaces, random variables, expectations and probabilities, conditional probability, independence, discrete and

continuous distributions, central limit theorem, Markov chains, and probabilistic modeling. After or concurrently with MATH 120 or equivalent. QR

S&DS 2420b / MATH 2420b, Theory of Statistics Zhou Fan
Study of the principles of statistical analysis. Topics include maximum likelihood, sampling distributions, estimation, confidence intervals, tests of significance, regression, analysis of variance, and the method of least squares. Some statistical computing. After S&DS 241 and concurrently with or after MATH 222 or 225, or equivalents. QR

S&DS 2650b, Introductory Machine Learning John Lafferty
This course covers the key ideas and techniques in machine learning without the use of advanced mathematics. Basic methodology and relevant concepts are presented in lectures, including the intuition behind the methods. Assignments give students hands-on experience with the methods on different types of data. Topics include linear regression and classification, tree-based methods, clustering, topic models, word embeddings, recurrent neural networks, dictionary learning and deep learning. Examples come from a variety of sources including political speeches, archives of scientific articles, real estate listings, natural images, and several others. Programming is central to the course, and is based on the Python programming language. Prerequisites: Two of the following courses: S&DS 230, 238, 240, 241 and 242; previous programming experience (e.g., R, Matlab, Python, C++), Python preferred. QR

S&DS 3120a, Linear Models Zongming Ma
The geometry of least squares; distribution theory for normal errors; regression, analysis of variance, and designed experiments; numerical algorithms, with particular reference to the R statistical language. After S&DS 242 and MATH 222 or 225. QR

S&DS 3510b / EENG 434 / MATH 2510b, Stochastic Processes Ilias Zadik
Introduction to the study of random processes including linear prediction and Kalman filtering, Poison counting process and renewal processes, Markov chains, branching processes, birth-death processes, Markov random fields, martingales, and random walks. Applications chosen from communications, networking, image reconstruction, Bayesian statistics, finance, probabilistic analysis of algorithms, and genetics and evolution. Prerequisite: S&DS 241 or equivalent. QR

S&DS 3520b / MB&B 3520b / MCDB 3520, Biomedical Data Science, Mining and Modeling Mark Gerstein and Matthew Simon
Techniques in data mining and simulation applied to bioinformatics, the computational analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. Sequence alignment, comparative genomics and phylogenetics, biological databases, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, microarray normalization, and machine-learning approaches to data integration. Prerequisites: MB&B 301 and MATH 115, or permission of instructor. SC 0 Course cr

S&DS 3610b / AMTH 3610b, Data Analysis Brian Macdonald
Selected topics in statistics explored through analysis of data sets using the R statistical computing language. Topics include linear and nonlinear models, maximum likelihood, resampling methods, curve estimation, model selection, classification, and clustering. Extensive use of the R programming language. Experience with R programming (from

e.g. S&DS 106, S&DS 220, S&DS 230, S&DS 242), probability and statistics (e.g. S&DS 106, S&DS 220, S&DS 238, S&DS 241, or concurrently with S&DS 242), linear algebra (e.g. MATH 222, MATH 225, MATH 118), and calculus is required. This course is a prerequisite for S&DS 425 and may not be taken after S&DS 425. QR

S&DS 3630b, Multivariate Statistics for Social Sciences Jonathan Reuning-Scherer
Introduction to the analysis of multivariate data as applied to examples from the social sciences. Topics include principal components analysis, factor analysis, cluster analysis (hierarchical clustering, k-means), discriminant analysis, multidimensional scaling, and structural equations modeling. Extensive computer work using either SAS or SPSS programming software. Prerequisites: knowledge of basic inferential procedures and experience with linear models. QR

S&DS 3640b / AMTH 3640b / EENG 454, Information Theory Yihong Wu
Foundations of information theory in communications, statistical inference, statistical mechanics, probability, and algorithmic complexity. Quantities of information and their properties: entropy, conditional entropy, divergence, redundancy, mutual information, channel capacity. Basic theorems of data compression, data summarization, and channel coding. Applications in statistics and finance. After STAT 241. QR

S&DS 3650a or b, Intermediate Machine Learning Staff
S&DS 365 is a second course in machine learning at the advanced undergraduate or beginning graduate level. The course assumes familiarity with the basic ideas and techniques in machine learning, for example as covered in S&DS 265. The course treats methods together with mathematical frameworks that provide intuition and justifications for how and when the methods work. Assignments give students hands-on experience with machine learning techniques, to build the skills needed to adapt approaches to new problems. Topics include nonparametric regression and classification, kernel methods, risk bounds, nonparametric Bayesian approaches, graphical models, attention and language models, generative models, sparsity and manifolds, and reinforcement learning. Programming is central to the course, and is based on the Python programming language and Jupyter notebooks. Prerequisites: a background in probability and statistics at the level of S&DS 242; familiarity with the core ideas from linear algebra, for example through Math 222; and computational skills at the level of S&DS 265 or CPSC 200. QR

S&DS 4000a / MATH 3300a, Advanced Probability Shuangping Li
Measure theoretic probability, conditioning, laws of large numbers, convergence in distribution, characteristic functions, central limit theorems, martingales. Some knowledge of real analysis assumed. QR

S&DS 4100a, Statistical Inference Theodor Misiakiewicz
A systematic development of the mathematical theory of statistical inference covering methods of estimation, hypothesis testing, and confidence intervals. An introduction to statistical decision theory. Prerequisite: level of S&DS 241.

* **S&DS 4250a or b, Statistical Case Studies** Staff
Statistical analysis of a variety of statistical problems using real data. Emphasis on methods of choosing data, acquiring data, assessing data quality, and the issues posed by extremely large data sets. Extensive computations using R statistical software. Prerequisites: S&DS 361, and prior course work in probability, statistics, and data

analysis (e.g. 363, 365, 220, 230, etc., equivalent courses, or equivalent research/internship experience). Enrollment limited; requires permission of the instructor. QR

* **S&DS 480oa or b, Individual Studies** Sekhar Tatikonda
Directed individual study for qualified students who wish to investigate an area of statistics not covered in regular courses. A student must be sponsored by a faculty member who sets the requirements and meets regularly with the student. Enrollment requires a written plan of study approved by the faculty adviser and the director of undergraduate studies.

S&DS 491oa and S&DS 492ob, Senior Project Brian Macdonald
Individual research that fulfills the senior requirement. Requires a faculty adviser and DUS permission. The student must submit a written report about results of the project.

Tamil (TAML)

* **TAML 1300a, Intermediate Tamil I** Staff
The first half of a two-term sequence designed to develop proficiency in comprehension, speaking, reading, and writing through the use of visual media, newspapers and magazines, modern fiction and poetry, and public communications such as pamphlets, advertisements, and government announcements. Prerequisite: TAML 120 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail minjin.hashbat@yale.edu for more information. L3 1½ Course cr

* **TAML 1400b, Intermediate Tamil II** Staff
The second half of a two-term sequence designed to develop proficiency in listening, speaking, reading, and writing. Focus on the communicative aspects of the language. Some attention to Tamil culture since the Sangam period. Prerequisite: TAML 130 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail minjin.hashbat@yale.edu for more information. L4 1½ Course cr

Theater, Dance, and Performance Studies (THST)

Tibetan (TBTN)

TBTN 1100a, Elementary Classical Tibetan I Staff
First half of a two-term introduction to classical Tibetan. The script and its Romanization, pronunciation, normative dictionary order, and basic grammar. Readings from Tibetan literature and philosophy. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L1 1½ Course cr

TBTN 1200b, Elementary Classical Tibetan II Staff
Second half of a two-term introduction to classical Tibetan. The script and its Romanization, pronunciation, normative dictionary order, and basic grammar. Readings from Tibetan literature and philosophy. Prerequisite: TBTN 110 or

equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L2 1½ Course cr

* **TBTN 1300a, Intermediate Classical Tibetan I** Staff
Continuation of TBTN 120. Introduction to more complex grammatical constructions. Further development of reading ability in various genres of Tibetan literature written prior to 1959. Prerequisite: TBTN 120 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail david.ortega@yale.edu for more information. L3 RP 1½ Course cr

* **TBTN 1400b, Intermediate Classical Tibetan II** Staff
Continuation of TBTN 130. Complex grammatical constructions. Further development of reading ability in various genres of Tibetan literature written prior to 1959. Prerequisite: TBTN 130 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail david.ortega@yale.edu for more information. L4 RP 1½ Course cr

TBTN 1500a, Advanced Classical Tibetan I Staff
This two-semester sequence, of which this class is the first half, is designed to assist students who already have the equivalent of at least two-years of Classical Tibetan language study. The course is intended to build on this foundation so that students gain greater proficiency in reading a variety of classical Tibetan writing styles and genres, including texts relevant to their research. The course readings focus primarily on texts written during the Ganden Phodrang period up through the 19th century. Over two semesters, the class covers three sets of materials: 1) famous or otherwise influential classical works (mostly historical, some literary); 2) important historical texts that have come to light in recent years but are scarcely known in western scholarship; and 3) classical language texts that support the research needs of enrolled students. Classical Tibetan grammar and other conventions are identified and discussed in the course of the readings. Prerequisite: TBTN 140, or equivalent. L5 RP

TBTN 1600b, Advanced Classical Tibetan II Staff
This is the second half of the two-semester class that is designed to assist students who already have the equivalent of at least two-years of Classical Tibetan language study. The course is intended to build on this foundation so that students gain greater proficiency in reading a variety of classical Tibetan writing styles and genres, including texts relevant to their research. The course readings focus primarily on texts written during the Ganden Phodrang period up through the 19th century. Over the two semesters, the class covers three sets of materials: 1) famous or otherwise influential classical works (mostly historical, some literary); 2) important historical texts that have come to light in recent years but are scarcely known in western scholarship; and 3) classical language texts that support the research needs of the enrolled students. Classical Tibetan grammar and other conventions are identified and discussed in the course of the readings. Depending on student interest, we will draw from a range of historical and literary genres: poetry (*snyan ngag*), biographies (*rnam thar*), avadanas (*rtogs brjod*), religious histories (*chos 'byung*), administrative documents (*gzhung yig*),

epistolary writings (e.g. *chab shog*), etc. Students also gain facility in kāvya-derived ornamental vocabulary and rhetorical devices. Prerequisite: L5, or equivalent. L5 RP

Turkish (TKSH)

TKSH 1100a, Elementary Modern Turkish I Meryem Yalcin
Integration of basic listening, reading, speaking, and writing skills through a variety of functional, meaningful, and contextual activities. Students become active users of modern Turkish and gain a deeper understanding of Anatolian culture through lessons based on real-life situations and authentic materials. L1 1½ Course cr

TKSH 1200b, Elementary Modern Turkish II Meryem Yalcin
Continuation of TKSH 1100. Prerequisite: TKSH 1100 or permission of instructor. L2 1½ Course cr

TKSH 1300a, Intermediate Turkish I Meryem Yalcin
Continued study of modern Turkish, with emphasis on advanced syntax, vocabulary acquisition, and the beginnings of free oral and written expression. Prerequisite: TKSH 1200 or permission of instructor. L3 1½ Course cr

TKSH 1400b, Intermediate Turkish II Meryem Yalcin
Continuation of TKSH 1300. Prerequisite: TKSH 1300. L4 1½ Course cr

* **TKSH 1500a, Advanced Turkish I** Meryem Yalcin
This advanced language course enhances students' linguistic proficiency while fostering cultural, digital, and artistic literacy. Through an in-depth study of genre, grammar, and vocabulary, students will engage with Turkish art, literature, and media. Readings span a diverse range of genres, including newspaper articles, interviews, literature, author's notes and formal writing. The course also integrates visual arts and discussions on Turkish painting, sculpture, music, and architecture. By analyzing artistic and cultural productions, students will deepen their understanding of Turkish society while refining their language skills. Prerequisite: TKSH 1400. L5, HU

Twi (TWI)

Ukrainian (UKRN)

UKRN 1100a, Elementary Ukrainian I Olha Tytarenko
The first half of a two-term introduction to Ukrainian for students with no previous knowledge of the language. Emphasis on speaking, reading, listening, and writing skills. Topics, vocabulary, and grammar lessons based on everyday linguistic interactions. L1 RP 1½ Course cr

UKRN 1200b, Elementary Ukrainian II Olha Tytarenko
The second half of a two-term introduction to Ukrainian for students with no previous knowledge of the language. Emphasis on speaking, reading, listening, and writing skills. Topics, vocabulary, and grammar lessons based on everyday linguistic interactions. Prerequisite: UKRN 110 or equivalent. L2 RP 1½ Course cr

* **UKRN 1300a, Intermediate Ukrainian I** Olha Tytarenko
Review and reinforcement of grammar fundamentals and of core vocabulary pertaining to common aspects of daily life. Special attention to verbal aspect and verbs of motion.

Emphasis on continued development of oral and written communication skills on topics such as the self, family, studies and leisure, travel, and meals. Prerequisite: UKRN 1200 or equivalent. L3 RP 1½ Course cr

* **UKRN 1400b, Intermediate Ukrainian II** Olha Tytarenko
Continued review and reinforcement of grammar fundamentals and of core vocabulary pertaining to common aspects of daily life. Special attention to verbal aspect and verbs of motion. Emphasis on further development of oral and written communication skills on topics such as the self, family, studies and leisure, travel, and meals. UKRN 1300 or equivalent. L4 RP 1½ Course cr

UKRN 1500a, Advanced Ukrainian I Staff
The course is for students who wish to develop their mastery of Ukrainian. Original texts and other materials drawn from classical and contemporary Ukrainian literature, press, electronic media, film, and the Internet are designed to give students familiarity with linguistic features typical of such functional styles as written and spoken, formal and informal, scientific and newspaper language, jargon, slang, etc. Ukrainian 140, or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L5 RP

UKRN 1600b, Advanced Ukrainian II Staff
The course is for students who wish to develop their mastery of Ukrainian. Original texts and other materials drawn from classical and contemporary Ukrainian literature, press, electronic media, film, and the Internet are designed to give students familiarity with linguistic features typical of such functional styles as written and spoken, formal and informal, scientific and newspaper language, jargon, slang, etc. UKRN 150, or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail sci-cls@yale.edu for more information. L5 RP

* **UKRN 3120a and UKRN 6120a / FILM 3007a / RSEE 3120a / SLAV 3120a and SLAV 6120a, Cinematic Ukraine: Culture, Identity, and Memory** Olha Tytarenko
This course traces the evolution of Ukrainian cinema from the avant-garde experiments of the 1920s to the vibrant post-2014 film resurgence. Exploring themes of national identity, historical memory, and resistance to political and cultural oppression, we analyze how filmmakers have shaped Ukraine's self-conception through film. Topics include the poetic cinema of the 1960s, post-Soviet transition films, and contemporary works responding to war and cultural sovereignty. Students will engage critically with cinematic language, narrative structures, and visual aesthetics while incorporating perspectives from postcolonial theory and memory studies. The course features guest lectures from Ukrainian film directors and hands-on cinematographic workshops. Weekly thematic units pair films with historical and theoretical readings, offering a dynamic exploration of Ukraine's place in global cinema and cultural history. None HU

Urban Studies (URBN)

URBN 1101a / AMST 1197a / ARCH 2600a / HIST 1125a / HSAR 3219a, American Architecture and Urbanism Staff
Introduction to the study of buildings, architects, architectural styles, and urban landscapes, viewed in their economic, political, social, and cultural contexts, from

precolonial times to the present. Topics include: public and private investment in the built environment; the history of housing in America; the organization of architectural practice; race, gender, ethnicity and the right to the city; the social and political nature of city building; and the transnational nature of American architecture. HU
0 Course cr

URBN 1102a / ARCH 2601a, Civic Art: Introduction to Urban Design Staff
Introduction to the history, analysis, and design of the urban landscape. Principles, processes, and contemporary theories of urban design; relationships between individual buildings, groups of buildings, and their larger physical and cultural contexts. Case studies from New Haven and other world cities. HU 0 Course cr

URBN 1300b / ARCH 1600b, Introduction to Urban Studies Staff
An introduction to key topics, research methods, and practices in urban studies, an interdisciplinary field of inquiry and action rooted in the experience of cities. As physical artifacts, the advent of large cities have reflected rapid industrialization and advanced capitalism. They are inseparable from the organization of economic life; the flourishing of cultures; and the formation of identities. They are also places where power is concentrated and inequalities are (re)produced. Debates around equity are filtered through urban environments, where struggles over jobs, housing, education, mobility, public health, and public safety are front and center. The course is organized as a colloquium with numerous guests. Accessible entirely online, there will also be live, in-person events, with social distancing and face masks/shields, available to students in New Haven. HU, SO 0 Course cr

URBN 2000b / ARCH 2000b / EVST 2000b, Scales of Design Bimal Mendis
Exploration of architecture and urbanism at multiple scales from the human to the world. Consideration of how design influences and shapes the material and conceptual spheres through four distinct subjects: the human, the building, the city, and the world. Examination of the role of architects, as designers, in constructing and shaping the inhabited and urban world. Lectures, readings, reviews and four assignments that address the spatial and visual ramifications of design. Not open to first-year students. Required for all Architecture majors. HU

* **URBN 3303a / ARCH 3102a, History of Landscape in Western Europe and the United States: Antiquity to 1950** Warren Fuermann
This course is designed as an introductory survey of the history of landscape architecture and the wider, cultivated landscape in Western Europe and the United States from the Ancient Roman period to mid-twentieth century America. Included in the lectures, presented chronologically, are the gardens of Ancient Rome, medieval Europe, the early and late Italian Renaissance, 17th century France, 18th century Britain, 19th century Britain and America with its public and national parks, and mid-twentieth century America. The course focuses each week on one of these periods, analyzes in detail iconic gardens of the period, and placse them within their historical and theoretical context. HU RP

* **URBN 3305a / ER&M 3044a / SOCY 3044a, Informal Cities** Leigh-Anna Hidalgo
The informal sector is an integral and growing part of major global cities. With a special focus on the context of U.S. cities, students examine where a burgeoning informality is visible in the region's everyday life. How planners and policymakers address informality is an important social justice challenge. But what is the informal

sector, or urban informality, or the informal city? This class addresses such questions through a rigorous examination of the growing body of literature from Sociology, Latinx Studies, Urban Planning, and Geography. We reflect on the debates and theories in the study of informality in the U.S. and beyond and gain an understanding of the prevalence, characteristics, rationale, advantages and disadvantages, and socio-spatial implications of informal cities. More specifically, we examine urban informality in work —examining street vendors, sex workers, and waste pickers—as well as housing, and the built environment. SO

* **URBN 3306a / ARCH 3601a, Difference and the City** Justin Moore
Four hundred and odd years after colonialism and racial capitalism brought twenty and odd people from Africa to the dispossessed indigenous land that would become the United States, the structures and systems that generate inequality and white supremacy persist. Our cities and their socioeconomic and built environments continue to exemplify *difference*. From housing and health to mobility and monuments, cities small and large, north and south, continue to demonstrate intractable disparities. The disparate impacts made apparent by the COVID-19 pandemic and the reinvigorated and global Black Lives Matter movement demanding change are remarkable. Change, of course, is another essential indicator of *difference* in urban environments, exemplified by the phenomena of disinvestment or gentrification. This course explores how issues like climate change and growing income inequality intersect with politics, culture, gender equality, immigration and migration, technology, and other considerations and forms of disruption.

* **URBN 3307b / EVST 2290b, Geographic Information Systems** Jill Kelly
A practical introduction to the nature and use of geographic information systems (GIS) in environmental science and management. Applied techniques for the acquisition, creation, storage, management, visualization, transformation, analysis, and synthesis of cartographic data in digital form.

* **URBN 3315b / ARCH 3103b, Revolutionary Cities: Protest, Rebellion and Representation in Modern Urban Space** Alan Plattus
Cities have always been hotbeds of radical ideas and actions. Their cafes and taverns, drawing rooms and universities have been incubators of new ideas, revolutionary ideologies and debate, while their streets and public spaces have been the sites of demonstrations, protests, and uprisings. Since cities are key nodes in larger networks of trade and cultural exchange, these local events have often had a global audience and impact. This seminar explores the interaction of urban space and event, and the media and technologies of revolutionary representation, through case studies of particular cities at transformational moments in their development. These begin with Boston in the 1760s and 1770s, and may include Paris in 1789, 1830, 1848, 1871 and again in 1968, St. Petersburg in 1917, Beijing in 1949 and again in 1989, Havana in 1959, Prague, Berlin and Johannesburg and other cities in 1989, Cairo in 2011, Hong Kong in 2011-12, 2014 and 2019, and other urban sites of the Occupy and Black Lives Matter movements. Course work in modern history is recommended. HU

* **URBN 3603a / ARCH 3304a, Urban Lab: An Urban World** Joyce Hsiang
Understanding the urban environment through methods of research, spatial analysis, and diverse means of representation that address historical, social, political, and environmental issues that consider design at the scale of the entire world. Through timelines, maps, diagrams, collages and film, students frame a unique spatial

problem and speculate on urbanization at the global scale. Prerequisites: For non-majors: permission of the instructor is required. For ARCH majors: ARCH 150, 200, and 280. HU 1½ Course cr

* **URBN 4900a / ARCH 4900a, Senior Research Colloquium** Kyle Dugdale
Research and writing colloquium for seniors in the Urban Studies and History, Theory, and Criticism tracks. Under guidance of the instructor and members of the Architecture faculty, students define their research proposals, shape a bibliography, improve research skills, and seek criticism of individual research agendas. Requirements include proposal drafts, comparative case study analyses, presentations to faculty, and the formation of a visual argument. Guest speakers and class trips to exhibitions, lectures, and special collections encourage use of Yale's resources.

* **URBN 4910b / ARCH 4910b, Senior Project** Kyle Dugdale
An essay or project in the student's area of concentration. Students in the history, theory, and criticism track or in the urban studies track pursue independent research with an adviser; this project must terminate in a senior essay.

Vietnamese (VIET)

VIET 1100a, Elementary Vietnamese I Quang Van
Students acquire basic working ability in Vietnamese, developing skills in speaking, listening, writing (Roman script), and reading. Discussion of aspects of Vietnamese society and culture. Intended for students with no previous knowledge of Vietnamese. L1 1½ Course cr

VIET 1200b, Elementary Vietnamese II Quang Van
Continuation of VIET 110. L2 1½ Course cr

* **VIET 1320a, Accelerated Vietnamese** Quang Van
This course follows a community-based language model designed for heritage students or speakers who comprehend and speak informal Vietnamese on topics related to everyday situations but do not read or write Vietnamese. Study of interpersonal, interpretive, and presentational communicative modes, as well as standard foreign language education (communication, cultures, connections, comparisons, and communities). Students will engage with Vietnamese American communities in New Haven and beyond. Admits to VIET 140. L3

* **VIET 1420b, Accelerated Vietnamese II** Quang Van
An accelerated course designed for heritage students who wish to build a higher level of proficiency and develop sociocultural competence in speaking, reading, and writing. Topics include health care, rituals, community, linguistic landscape, education, mass communication, literature, history, values, and traditional and pop cultures. VIET 132 or equivalent. L4

* **VIET 1600a, Advanced Vietnamese II** Quang Van
Aims to enable students to achieve greater fluency and accuracy in the language beyond the intermediate level and to solidify their reading, writing, speaking, and listening skills. Topics include socio-cultural practices, romantic love, healthcare, history, gender issues, pop music, and food culture. Prerequisite: L4 Vietnamese or equivalent. L5

*** VIET 4600b, Readings in Vietnamese** Quang Van
This reading course provides an opportunity for students at an advanced Vietnamese language level (L5) to rigorously engage in concentrated reading and research in Vietnamese language. Prerequisite: L5 proficiency and permission of the course instructor. L5

Wolof (WLOF)

Women's Gender and Sexuality Studies (WGSS)

*** WGSS 0031a / AMST 0031a, LGBTQ Spaces and Places** Scott Herring
Overview of LGBTQ cultures and their relation to geography in literature, history, film, visual culture, and ethnography. Discussion topics include the historical emergence of urban communities; their tensions and intersections with rural locales; race, sexuality, gender, and suburbanization; and artistic visions of queer and trans places within the city and without. Emphasis is on the wide variety of U.S. metropolitan environments and regions, including New York City, Los Angeles, Miami, the Deep South, Appalachia, New England, and the Pacific Northwest. Enrollment limited to first-year students. HU

*** WGSS 0032a, History of Sexuality** Maria Trumpler
Exploration of scientific and medical writings on sexuality over the past century. Focus on the tension between nature and culture in shaping theories, the construction of heterosexuality and homosexuality, the role of scientific studies in moral discourse, and the rise of sexology as a scientific discipline. Enrollment limited to first-year students. WR, HU

WGSS 741a / AMST 7740a / FILM 6810a, The Photographic Memory Workshop
Laura Wexler
This seminar considers landmark examples of photography's cultural work in producing, cementing and erasing individual and collective memory. Topics to be considered include but are not confined to "memory, post-memory and counter-memory"; "the biopolitics of images"; "the visuality of violence"; "photography's place and space"; and the "potential history of photography." Students are invited to develop and present their own case studies on topics of interest. Readings encompass: *The Unseen Truth* by Sarah Lewis; *Camera Geologica* by Siobhan Angus; *The Unintended* by Monica Huerta; *Race Stories* by Maurice Berger; *Through a Native Lens* by Nicole Dawn Strathman; *When a Photograph is Home* by Leigh Raiford; *From These Roots* by Tamara Lanier; and *Collaboration: A Potential History of Photography* by Ariella Azoulay, Wendy Ewald, Susan Meiselas, Leigh Raiford, and Laura Wexler. Guest lectures and travel to exhibitions are anticipated.

WGSS 1109a / AMST 1109a / HIST 2140a, US LGBTQ History & Queer Futures
Staff
This interdisciplinary course offers a critical overview of queer history in the United States from the colonial era to the present, exploring the lives and experiences of LGBTQ individuals and emphasizing the broader historical evolution of ideas about sex, sexuality, and gender that constitute the ever-changing landscape of queer history. Through an intersectional lens, students analyze how gender, sexuality, race, and class have shaped LGBTQ identities, cultures, and political movements. Drawing

heavily from primary sources including historical texts, literature, visual culture, and popular media, we investigate how queer lives and experiences have been represented, constructed, and contested across time. HU 0 Course cr

WGSS 1125b / AFAM 1615b, "We Interrupt this Program: The Multidimensional Histories of Queer and Trans Politics" Roderick Ferguson
In 1991, the arts organizations Visual AIDS and The Kitchen collaborated with video artist and filmmaker Charles Atlas to produce the live television broadcast "We Interrupt this Program." Part educational presentation, part performance piece, the show was aired in millions of homes across the nation. The program, in The Kitchen's words, "sought to feature voices that had often been marginalized within many discussions of AIDS, in particular people of color and women." This course builds upon and is inspired by this aspect of Atlas's visionary presentation, an aspect that used the show to produce a critically multicultural platform that could activate cultural histories and critical traditions from various communities. In effect, the course uses this aspect as a metonym for the racial, gender, sexual, and class heterogeneity of queer art and organizing. It conducts its investigation by looking at a variety of primary materials that illustrate the heterogeneous makeup of queer and trans politics. The course also draws on more recent texts and visual works that arose from the earlier contexts that the primary texts helped to illuminate and shape. HU RP 0 Course cr

* **WGSS 1135a / AMST 3325a / ER&M 3556a, Latina.x.e Feminist Archives** Deb Vargas
The course introduces students to Latina/x/e feminist archives. We focus on historical and contemporary writings by and about Chicana, Puerto Rican, Central American, and other Latina/x/e feminist writers and activists. The course draws from interdisciplinary scholarship addressing the intellectual landscape of Latina/x/e and critical race feminist theories and social movement activist organizing. While this course approaches Latina/x/e feminist theories and activism as often having emerged in relation to U.S. nation-making projects we will consider this work with the understanding that projects of Latina/x/e feminism should be understood as cross-border, transnational, and multi-scaler critiques of nation-state violence. HU

WGSS 1145b / LING 1460b / PSYC 3129b, Language and Gender Natalie Weber
An introduction to linguistics through the lens of gender. Topics include: gender as constructed through language; language variation as conditioned by gender and sexuality within and between languages across the world; real and perceived differences between male and female speech; language and (non)binarity; gender and noun class systems in language; pronouns and identity; role of language in encoding, reflecting, or reinforcing social attitudes and behavior. This course was previously offered as PSCY 329. SO

* **WGSS 1701a / FILM 2897a / GMAN 1701a, Gender and Sexuality in German Literature and Film** Lea Jouannais
In this course, we will explore the 20th-century German artistic, literary, and cinematic canon through the lens of gender and sexuality. Queer and feminist perspectives will play a central role in our discussions, while also providing students with a broader understanding of artistic movements in the German-speaking world. A chronological approach, spanning from the interwar period to the present day, will serve as a guide through key moments in German history. Our readings and analyses will include works by Irmgard Keun and Mela Hartwig in the interwar period, August Sander's

photographs, excerpts of Klaus Mann and Annemarie Schwarzenbach's texts, postwar literature with Ingeborg Bachmann, New German Cinema through the films of RW Fassbinder and Ulrike Ottinger; a novel by Elfriede Jelinek, the poetry of May Ayim, and contributions from contemporary German voices. This course is conducted entirely in German. It is recommended that students have completed one other L5 class, though exceptions are possible on a case-by-case basis. Please contact Language Program Director Theresa Schenker with questions: theresa.schenker@yale.edu L5, HU

WGSS 2165a / FILM 2167a / LAST 2165a / PORT 2165a / SPAN 2090a, Through the Lens of Memory: Other Perspectives on Dictatorships in Latin America and Iberia Giseli Tordin

This course examines the cinematic portrayals of military dictatorships in Brazil, Argentina, Chile, Spain, and Portugal, exploring how film serves as both a historical document and a means to reinterpret and reconstruct the past. As a language course, it allows students to engage with multiple modes of meaning—linguistic, visual, auditory, tactile, gestural, and spatial—through which cinema conveys its narratives. Students analyze how films reconstruct memory, challenge hegemonic historiography, and reinscribe erased or silenced perspectives. The course reflects on the relevance of these works in contemporary struggles against violence and oppression, considering how they teach us to critically engage with power, resistance, and collective memory. It also focuses on women's cinematic productions and representations, examining how gender, race, and political resistance intersect in the visual representation of repression, violence, and memory. The course incorporates both Spanish and Portuguese, encouraging students to express their ideas and develop projects in either language. Languages: Portuguese and Spanish. Prerequisite: PORT 1400 (or equivalent) or SPAN 1400 (or equivalent). L5, HU

* **WGSS 2202b / AFAM 2339b / AMST 4461b / EDST 2209b / ER&M 1692b, Identity, Diversity, and Policy in U.S. Education** Craig Canfield

Introduction to critical theory (feminism, queer theory, critical race theory, disability studies, trans studies, Indigenous studies) as a fundamental tool for understanding and critiquing identity, diversity, and policy in U.S. education. Exploration of identity politics and theory, as they figure in education policy. Methods for applying theory and interventions to interrogate issues in education. Application of theory and interventions to policy creation and reform. EDST 1110 recommended. WR, HU

WGSS 2204a / PLSC 2253a, Women, Politics, and Policy Staff

This course is an introduction to the way gender structures how we interpret the political world, exploring topics such as women's access to power, descriptive and substantive representation, evaluation of the functioning of political institutions, and analysis of government policy It also serves as an introduction to reading and producing empirical research on gender in the social sciences. SO o Course cr

* **WGSS 2205a / ER&M 1681a, Bodies and Pleasures, Sex and Genders** Eda Pepi

This seminar explores questions of embodiment—its pleasures, perplexities, and pains—to interrogate sex, sexuality, and gender as analytical categories. Its aim is to evaluate formative concepts, theories, and debates within feminist, gender, and queer studies, critical race studies, and history. We will consider how terms like "women" and "men," "femininity" and "masculinity," "homosexuality" and "heterosexuality," and "gender" and "transgender" have structured people's experiences and perceptions of bodies—their own and others'. We will interrogate the dynamic and often contested relationship

between "gender" and "sexuality," and their constitution through other axes of power and difference, including race, class, and (dis)ability. SO

* **WGSS 2206b / ER&M 257, Transnational Approaches to Gender & Sexuality** Evren Savci

Examination of transnational debates about gender and sexuality as they unfold in specific contexts. Gender as a category that can or cannot travel; feminist critiques of liberal rights paradigms; globalization of particular models of gender/queer advocacy; the role of NGOs in global debates about gender and sexuality. WR

WGSS 2207b / PLSC 2322b, Gender, Justice, Power, Institutions Jiya Pandya

Welcome to *Gender, Justice, Power & Institutions*, a mouthful of abstractions that we work together to comprehend and critique throughout the semester. An aspiration of this course, as political as it is pedagogic, is that students approach their world-building projects with an enriched understanding of the ways gender, justice, and power shape and are shaped by institutions, inequality, and theory. Part I opens up some preliminary considerations of our course terms by investigating the case of abortion, abortion rights, and reproductive justice. The topic is politically loaded, philosophically complex, and emotionally challenging; the point is not to convince you of the permissibility or impermissibility of abortion, but to explore how the contested case configures, imbricates, and puts pressure on our course terms. In Part II, we examine the historical and conceptual coordinates of the courses first three titular terms: is gender a subjective identification, social ascription, or axis of inequality? Is justice a matter of redistribution, recognition, resources, capabilities, or something more hedonic? Where is power located, or where does it circulate? Who are what leverages power? In Part III, we consider ways gender, justice, and power travel within and across several institutions: heterosexuality, the university, the trafficking/anti-trafficking industrial complex, the prison, and the bathroom. Part IV closes out the course by focusing on the reconfiguration of democratic institutions in late modernity; or, can institutions "love us back" under the the political economy we shorthand as "neoliberalism"? SO o Course cr

* **WGSS 2209b / CLCV 2199 / CPLT 2390b / HELN 2160b, Dionysus in Modernity** George Syrimis

Modernity's fascination with the myth of Dionysus. Questions of agency, identity and community, and psychological integrity and the modern constitution of the self. Manifestations of Dionysus in literature, anthropology, and music; the Apollonian-Dionysiac dichotomy; twentieth-century variations of these themes in psychoanalysis, surrealism, and magical realism. HU TR

WGSS 2212a, Monogamy and its Discontents Staff

While monogamy is central to Michel Foucault's formulation of normative sexuality that arose in the 19th century (the Malthusian couple as adult, monogamous, heterosexual, married, and reproductive), little attention has been paid to it as a particular historical form of intimacy. We investigate this structure of intimacy through theoretical, historical, ethnographic, literary, and visual materials and think about the various meanings of monogamy historically as well as transnationally. Monogamy is entangled with relations of private property, with colonial civilizational narratives, with scientific theories about human nature. Polygamy in return has historically been understood as religious and/or cultural difference, and as a remnant of pre-modernity. The course weaves together theoretical readings that equip students with

the tools to understand some key concepts that we need for our discussion, such as private property; the private family; colonialism and (cultural) imperialism; law and liberalism; and bourgeois morality with readings that more directly address some of the key ways in which monogamy is imagined, understood and framed. We discuss the turn to a recent rise in nonmonogamy in the "West" as a radical and "liberated" alternative to life-long or serial monogamy, at times featuring a critique of the private family, which constitutes a curious contrast to the nonmonogamy of religious and cultural Others of the West. Understanding the contemporary discourses and industries (books, podcasts, therapists' youtube channels) around polyamory and nonmonogamy as a 21st century strategic unity, we analyze how liberalism has framed our understanding of sexual liberation and discuss alternative approaches to freedom. HU o Course cr

WGSS 2230a / ANTH 2530a, Evolutionary Biology of Female Bodies Claudia Valeggia

Evolutionary, biosocial, and situated perspectives on the female body. Physiological, ecological, social and cultural aspects of the development of female bodies from puberty through menopause and aging, with special attention to lived experiences. Variation in female life histories in a variety of cultural and ecological settings. Examples from both traditional and modern societies. SC o Course cr

* **WGSS 2233a / FILM 3417 / HELN 2380a, Weird Greek Wave Cinema** George Syrimis

The course examines the cinematic production of Greece in the last fifteen years or so and looks critically at the popular term "weird Greek wave" applied to it. Noted for their absurd tropes, bizarre narratives, and quirky characters, the films question and disturb traditional gender and social roles, as well as international viewers' expectations of national stereotypes of classical luminosity–the proverbial "Greek light"–Dionysian exuberance, or touristic leisure. Instead, these works frustrate not only a wholistic reading of Greece as a unified and coherent social construct, but also the physical or aesthetic pleasure of its landscape and its 'quaint' people with their insistence on grotesque, violent, or otherwise disturbing images or themes (incest, sexual otherness and violence, aggression, corporeality, and xenophobia). The course also pays particular attention on the economic and political climate of the Greek financial crisis during which these films are produced and consumed and to which they partake. HU

* **WGSS 2235a / AMST 2233a / ER&M 3536a / HIST 2196a, Another "Other"—Introducing Critical Theories and Histories of Disability** Jiya Pandya

What is disability? How has its definition changed over time? How do people "become" disabled and how does one inhabit a disabled body? In what ways has the disabled body become a site for enacting imperial, national, and resistant politics? Where and how are alternate, radical visions of health being developed? This introductory course in Disability Studies poses answers to these and other related questions through an overview of key texts and debates in the growing field of disability studies. Students will learn about the transnational history of disability and disability rights, think about the intersections of disability, race, sexuality, gender, and citizenship, and engage with questions of accessibility and activism that already exist in spaces around you. This course, composed of three modules on "disability," "disidentifications" with disability, and "disability justice" and "health liberation," is meant to be both an academic overview of a field and a toolkit

for advocacy. As we reckon with the longer impacts of COVID-19 and process what it means to live life during and after a global pandemic, it makes most sense for us to turn to those who have reckoned with what it means to live in "crisis," to inhabit a body that is almost-always at "risk," and to build creative forms of care and community. We will spend significant time with disabled writers, artists, and scholars who offer insight and memory about interactions with and between medicine, war, design, technology, sexuality, race, and imperialism. none

* **WGSS 2238b, Foucault and the Sexual Self** Igor De Souza
This course explores the main ideas and influence of Foucault's *History of Sexuality*. Alongside the methods and conclusions of the *HS*, we examine the implications of the *HS* for feminist studies and queer theory, and the approach of the *HS* towards ancient Greek sexuality. HU

* **WGSS 2239b / AMST 2239 / EDST 1235b, Education and the Culture Wars** Talya Zemach-Bersin
Examination of the historical development and politics of the "culture wars" with a focus on how battles over the "soul of America" have focused on the American education system. Conflict over "American values" issues like abortion, gay marriage, and religion are compounded by legal battles over federal funding and school choice. Study of interdisciplinary readings from law, politics, history, and cultural studies. EDST 1110 recommended.

* **WGSS 2251a / ENGL 3751a, Experiments in the Novel: The Eighteenth Century** Jill Campbell
The course provides an introduction to English-language novels of the long eighteenth century (1688–1818), the period in which the novel has traditionally been understood to have "risen." Emphasizing the experimental nature of novel-writing in this early period of its history, the course foregrounds persistent questions about the genre as well as a literary-historical survey: What is the status of fictional characters? How does narrative sequence impart political or moral implications? How do conventions of the novel form shape our experience of gender? What kind of being is a narrator? Likely authors include Aphra Behn, Daniel Defoe, Samuel Richardson, Henry Fielding, Laurence Sterne, Maria Edgeworth, Jane Austen, Jennifer Egan, Colson Whitehead, and Richard Powers. WR, HU

* **WGSS 2271a / SOCY 3707a, Prison Nation, Race, Gender, Crime, and Abolition Politics** Staff
Mass incarceration and police violence are pressing human rights issues in the contemporary Americas. The US carceral state is sweeping, with nearly 2 million people currently incarcerated on any given day and a targeted policing apparatus that brings people under the penal net. At the same time, countries in Latin America have high rates of incarceration and often even higher rates of police violence than the US. These dynamics are deeply racialized and shape individuals, families, and communities. But that is not the full story. Liberatory movements have resisted and surged against this subjugation for decades. In this course, students will comparatively study the development of the contemporary carceral state and the political struggles waged against it. Students will read across the social sciences, Black studies, history, and law, as well as performance, memoir, and testimony. By examining the carceral state in this way, students will gain a critical lens on longstanding debates related to race and racism, justice and injustice, and reparation and abolition, in both the US and

Latin America. While the course is not exhaustive, it is meant to equip students with a working framework on the critical debates in the field. This course is not open to students previously enrolled in SOCY 105/WGSS 106. SO

WGSS 2272a / AMST 2272a / ER&M 2682a / HIST 1183a, Asian American History, 1800 to the Present Staff
An introduction to the history of East, South, and Southeast Asian migrations and settlement to the United States from the late eighteenth century to the present. Major themes include labor migration, community formation, U.S. imperialism, legal exclusion, racial segregation, gender and sexuality, cultural representations, and political resistance. HU o Course cr

* **WGSS 2297b / HIST 3718b, Gender Expression Before Modernity** Igor De Souza
What are the historical forms of gender non-conformity? This course investigates expressions of gender that were considered non-conforming within their historical contexts. Our point of departure is the idea that gender constitutes a "useful category of historical analysis" (Joan Scott). In this course we ask how deviant gender expression can be a category of historical analysis. How do we write history from the perspective of gender fluidity, non-binarism, and gender transgression? How can this history give us the tools to critique regnant norms of gender expression, then and now? How does this historical approach relate to trans* and non-binary people & movements today? The course is historically wide-ranging, from Antiquity to the Early Modern period, and geographically diverse, including Europe, the Middle East, and the colonial Americas. The breath of contexts enable us to consider broad patterns, continuities, and discontinuities. At the same time, we discuss the specificities of particular contexts, emphasizing the connection between gender fluidity/non-conformity, on the one hand, and local cultural norms around gender and sex, on the other. We investigate intellectual and cultural trends, as well as the lives of gender fluid/non-conforming individuals. We analyze sources drawn from law, medicine, religion, philosophy, visual arts & literature, biographies, and memoirs. All readings are in English translation. No prior background is required. However, it will be helpful to have taken either WGSS 291/HIST 287J or WGSS 306 before or in concurrence with this course. HU

* **WGSS 3305a / AFAM 3615a, Black Feminist Theory** Gail Lewis
This course is designed to introduce you to some of the major themes in black feminist theory. The course does so by presenting classic texts with more recent ones to give you a sense of the vibrancy of black feminist theory for addressing past and present concerns. Rather than interpret black feminist theory as a critical formation that simply puts race, gender, sexuality, and class into conversation with one another, the course apprehends that formation as one that produced epistemic shifts in how we understand politics, empire, history, the law, and literature. This is by no means an exhaustive list of the areas into which black feminism intervened. It is merely a sample of some of the most vibrant ideological and discursive contexts in which black feminism caused certain epistemic transformations. SO

* **WGSS 3312a / AMST 3302a / ER&M 3012a / HSHM 4930a, Technology, Race and Gender** Kalindi Vora
In this course, we discuss technology and the politics of difference through a survey of topics including artificial intelligence, digital labor (crowdsourcing), and robotics and computer science. Materials for study include humanistic and social scientific critique, ethnographies of technology, technical writing and scientific papers, as well as

speculative art practices including design, visual art and fiction. What assumptions and politics of imagination govern the design and development of new technologies? What alternative imaginaries, politics, or even speculations, can be identified with a feminist analytic lens? The seminar also includes a practicum component where we practice the politics of speculation through writing and design projects. To do this we study everything from active STEM projects at Yale to speculative fiction and film to think about how structures of race, gender, sexuality, ability, nation, and religious difference inform how we "speculate" or imagine the future through the ways we design and build technological worlds in practice and in fiction. HU, SO

* **WGSS 3321b / ANTH 3821b / MMES 3321b / SOCY 3433b, Middle East Gender Studies** Marcia Inhorn

The lives of women and men in the contemporary Middle East explored through a series of anthropological studies and documentary films. Competing discourses surrounding gender and politics, and the relation of such discourse to actual practices of everyday life. Feminism, Islamism, activism, and human rights; fertility, family, marriage, and sexuality. SO

* **WGSS 3334b / ARCH 3109b / ER&M 1638b, Making the Inclusive Museum: Race, Gender, Disability and the Politics of Display** Joel Sanders

BLM and COVID-19 have underscored the imperative for public institutions like art museums to reckon with a longstanding dilemma: museum architecture, working in relationship with the art it displays, perpetuation of white supremacy, heteronormativity, and ableism. This seminar uses the resources of the Yale University Art Gallery and the Yale Center for British Art to situate this contemporary challenge in a cultural and historical context by tracing the intertwined histories of art and gallery architecture from the 16th century to today. Looking back allows us to imagine alternative futures: we consider the work of contemporary scholars, artists, designers, and public health experts who are developing strategies for making 21st-century museums inclusive environments that promote multi-sensory experiences among people of different races, genders, and abilities. Instructor permission is required based on the submission of an Expression of Interest with the following info: Name, Class year, Major/Concentration, Email and a paragraph describing relevant experiences that would allow you to make a meaningful contribution to the class. HU RP

* **WGSS 3335b / AMST 3336b, LGBTQ Life Spans** Scott Herring

Interdisciplinary survey of LGBTQ life spans in the United States concentrating primarily on later life. Special attention paid to topics such as disability, aging, and ageism; queer and trans creative aging; longevity and life expectancy during the AIDS epidemic; intergenerational intimacy; age and activism; critiques of optimal aging; and the development of LGBTQ senior centers and affordable senior housing. We explore these topics across multiple contemporary genres: documentary film (*The Joneses*), graphic memoir (Alison Bechdel's *Fun Home*), poetry (Essex Hemphill's "Vital Signs"), fabulation (Saidiya Hartman's *Wayward Lives, Beautiful Experiments*), and oral history. We also review archival documents of later LGBTQ lives—ordinary and iconic—held at the Beinecke Rare Book and Manuscript Library as well as the Lesbian Herstory Archives. HU

* **WGSS 3340a, Feminist and Queer Theory** Caleb Knapp

Historical survey of feminist and queer theory from the Enlightenment to the present, with readings from key British, French, and American works. Focus on the foundations

and development of contemporary theory. Shared intellectual origins and concepts, as well as divergences and conflicts, among different ways of approaching gender and sexuality. WR, HU

* **WGSS 3350a / AMST 3300a, The Invention of Love** Igor De Souza
This course proposes a historical, theoretical, and cultural investigation of what we call "romantic love," the kind of love we tend to associate with courtship, with relationships that include a sexual-erotic component, and with marriage. We begin with Denis de Rougemont's controversial thesis that romantic love was invented around the 1200s in the courtly culture of Southern France. We examine manifestations of romantic love in medieval Arab cultures as precedents to the invention of courtly love. In the second part of our course, we turn to modern humanistic theories about romantic love. Among the questions that critical theorists and philosophers have posed, we consider: How is love related to desire? Is sexual desire an indispensable component of romantic love? Is romantic love ultimately a selfish, exclusionary act, or is it about renouncing the self, losing the self in the other? In the third part of our course, we apply the insights of parts 1 and 2 to discuss case studies of romantic love in the contemporary United States. In this section, we explore reining assumptions between romantic love and: marriage; monogamy; dating; the digital environment; queerness; age; and transnationalism.

* **WGSS 3419a / HIST 3419a, Modern South Asian Histories of the Body** Jiya Pandya
Beginning from the recognition that bodies are contextually specific and historically produced, we chart South Asia's history in the 19th, 20th, and 21st centuries from the vantage point of the body. Unpacking the body's role as a site of power in imperial, nationalist, and postcolonial politics, we investigate how our narratives of history deepen when we make questions of race, caste, gender, sexuality, and disability central to our narratives. To understand some of the vast array of embodied practices under empire and in new national states, we consider the perspectives of multi-disciplinary scholars across a series of themes like violence, labor, war, and health. Together, we work to foster ethical engagement with historical subjects and to understand the lasting legacies of embodied histories on the social and political worlds of South Asia today. HU

* **WGSS 3831a / AMST 3831a / ENGL 3831a / ER&M 3831a, Texxture** Sunny Xiang
The term *texxture* was first used by queer studies scholars to describe a density of tactile information about an object's provenance, composition, circulation, and use. This brilliant coinage offers an immanent theorization of texture as something like an x-factor—an excess and an essence, something magical yet practical, a strange intensity and the thing itself. Such ambiguities, however, also contribute to texture's interpretive difficulties. For whether we have in mind a velvet armchair, a pair of distressed jeans, a handbound book, or a tablet computer, texture performs a dramatic revelation to the extent that it is also shadowed by deception and ambivalence. These paradoxes and cruxes inspire a range of inquiries for our class: What can the perception and creation of texture teach us about the sensorial and material politics of race, gender, empire, capitalism, and art? How might texture help us study the relation between desire and violence, especially at the interface of touch? What things, beings, events, places, emotions, and ideas appear to have a texture? What is texture's route to intelligibility, and is there a scale or unit at which texture vanishes? WR, HU

*** WGSS 4403a / SPAN 3525a, Women Writers of Spain** Noel Valis
The development of women's writing in Spain, with a focus on the modern era. Equal attention to the sociohistorical and cultural contexts of women writers and to the narrative and poetic strategies the authors employed. Some readings from critical and theoretical works. L5, HU

*** WGSS 4409b / AMST 4409b / HIST 3166b, Asian American Women and Gender, 1830 to the Present** Mary Lui
Asian American women as key historical actors. Gender analysis is used to reexamine themes in Asian American history: immigration, labor, community, cultural representations, political organizing, sexuality, and marriage and family life. WR, HU

*** WGSS 4413a / TDPS 4016a, Feminist Theater and Performance Art** Elise Morrison
This course presents a range of works by feminist scholars, activists, writers, and performers who have used live, embodied performance as a means by which to critique and reimagine cultural representations of gender and sexuality. Students will utilize their performance making as a primary mode of researching and critically engaging with historical and contemporary examples of feminist performance work. Through readings, viewings, group discussions, and weekly performance etudes we will map out significant theories, debates, and performance strategies that emerged out of the feminist movement(s) of the twentieth and early twenty-first centuries. HU

*** WGSS 4416a / ER&M 3535a / FREN 4160a, Social Mobility and Migration** Morgane Cadieu
The seminar examines the representation of upward mobility, social demotion, and interclass encounters in contemporary French literature and cinema, with an emphasis on the interaction between social class and literary style. Topics include emancipation and determinism; inequality, precarity, and class struggle; social mobility and migration; the intersectionality of class, race, gender, and sexuality; labor and the workplace; homecomings; mixed couples; and adoption. Works by Nobel Prize winner Annie Ernaux and her peers (Éribon, Gay, Harchi, Linhart, Louis, NDiaye, Taïa). Films by Cantet, Chou, and Diop. Theoretical excerpts by Berlant, Bourdieu, and Rancière. Students will have the option to put the French corpus in dialogue with the literature of other countries. Conducted in French. HU

*** WGSS 4419a / HIST 3719a / HSHM 4330a, Gender and Science** Deborah Coen
Exploration of the dual potential of the sciences to reinforce received ideas about gender or to challenge existing sexual and racial hierarchies; the rise of the ideas and institutions of the modern sciences as they have reflected and shaped new notions of femininity and masculinity. WR, HU

*** WGSS 4430b / ANTH 441 / ANTH 4841b / MMES 4430b, Gender and Citizenship in the Middle East** Eda Pepi
This seminar explores the complex interplay between gender, sexuality, and citizenship in the Middle East and North Africa. We examine how they are both shaped by and shape experiences of nationality, migration, and statelessness. Highlighting how gender and sexual minorities, and the gendered regulation of life, more broadly, both animate and contest colonial legacies tied to a racialized notion of "modernity." Through ethnography, history, and literature, students confront a political economy of intimacies that continuously reshape what it means to be or not to be a citizen. Our approach extends beyond borders and laws to include the everyday acts of citizenship that rework

race, religion, and ethnicity across transnational fronts. We discuss how people navigate their lives in the everyday, from the ordinary poetry of identity and belonging to the spectacular drama of war and conflict. Our goal is to challenge orientalist legacies that dismiss theoretical insights from scholarship on and from this region by labeling it as focused on exceptional cases instead of addressing "universal" issues. Instead, we take seriously that the specific historical and social contexts of the Middle East and North Africa reveal how connections based on gender and sexuality within and across families and social classes are deeply entwined with racial narratives of state authority and political sovereignty on a global scale. SO

* **WGSS 4435a / AMST 2253 / ENGL 2853 / HIST 3742a / HSHM 4180a / SOCY 3233, Queer Science** Juno Richards

Why are there so many studies involving trans brain scans? Can facial recognition technology really tell if you're queer? Why is everyone so obsessed with gay penguins? For that matter, how did science come to be the right tool for defining and knowing sex, gender, and sexuality at all? How does that history influence our collective lives in the present, and what are some alternatives? This course gives students a background in the development of sex science, from evolutionary arguments that racialized sexual dimorphism to the contemporary technologies that claim to be able to get at bodily truths that are supposedly more real than identity. It introduces scholarly and political interventions that have attempted to short-circuit the idea that sex is stable and knowable by science, highlighting ways that queer and queering thinkers have challenged the stability of sexual categories. It concludes by asking how to put those interventions into practice when so much of the fight for queer rights, autonomy, and survival has been rooted in categorical recognition by the state, and by considering whether science can be made queer. HU

* **WGSS 4438a, Subjectivity and its Discontents: Psychosocial Explorations in Black, Feminist, Queer** Gail Lewis

Questions of subjectivity stand at the base of much feminist, black, queer scholarship yet how subjectivity is constituted, whether it is fixed or fluid, how it links to narratives of experience, and how it can be apprehended in critical inquiry is often left implicit. Beginning with a brief consideration of psychoanalytic conceptions of 'the subject', 'subjectivity' and their relation to social formations, this course examines some of the ways in which subjectivity has been theorized and brought under critical scrutiny by black diasporic, feminist and queer scholars. It draws on work produced in reference to multiple sites, including the UK, the USA and the Caribbean within the fields of psychoanalysis, social science, the humanities and critical art practice. It aims to critique the divide between 'interior' psychic life and 'exterior' social selves, as well as considering the relation between 'freedom' and subjectivity, including the extent to which 'freedom' might require rejection of 'subjectivity' as a mode of personhood. SO

* **WGSS 4448a / HIST 3177a / HSHM 4480a, American Medicine and the Cold War** Naomi Rogers

The social, cultural, and political history of American medicine from 1945 to 1960. The defeat of national health insurance; racism in health care; patient activism; the role of gender in defining medical professionalism and family health; the rise of atomic medicine; McCarthyism in medicine; and the polio vaccine trials and the making of science journalism. WR, HU

* **WGSS 44459a / ANTH 4855a, Masculinity and Men's Health** Marcia Inhorn
Ethnographic approaches to masculinity and men's health around the globe. Issues of ethnographic research design and methodology; interdisciplinary theories of masculinity; contributions of men's health studies from Western and non-Western sites to social theory, ethnographic scholarship, and health policy. SO RP

* **WGSS 4465b / HIST 3747b / HIST 447J / HSHM 4670b, History of the Body** Ziv Eisenberg
What does it mean to have a "bad hair day?" How should you care for your skin? What happens when you eat a burger and drink wine? How are babies made? What happens when you die? The answers depend not only on who provides them, but also on where and when. This seminar examines historical production of systems of corporeal knowledge and power, as well as the norms, practices, meanings, and power structures they have created, displaced, and maintained. Structured thematically, the course familiarizes students with major topics in the history of the body, health, and medicine, with a particular focus on US history. WR, HU

* **WGSS 4490a, The Senior Colloquium** Joseph Fischel
A research seminar taken during the senior year. Students with diverse research interests and experience discuss common problems and tactics in doing independent research.

* **WGSS 4491b, The Senior Essay** Igor De Souza
Independent research on, and writing of, the senior essay.

* **WGSS 4518b / ANTH 4818b / ER&M 4518b and ER&M 6606b / SPAN 4618b, Multi-Sited Ethnography: Trans-Atlantic Port Cities in Colombia and Spain** Eda Pepi and Ana Ramos-Zayas
Critical to colonial, imperial, and capitalist expansion, the Atlantic offers a dynamic setting for adapting ethnographic practices to address questions around interconnected oppressions, revolts, and revolutions that are foundational to global modernity. Anchored in a Spanish and a Colombian port city, this course engages trans-Atlantic 'worlding' through a multi-sited and historically grounded ethnographic lens. Las Palmas—the earliest mid-Atlantic port and Europe's first settler colony in Africa—and Cartagena—once the principal gateway connecting Spain and its American empire—illuminate urgent contemporary issues such as climate, displacement, inter-regional subjectivities, and commerce. During a spring recess field experience (March 8–16, 2026), students immerse themselves for four nights each in Las Palmas and Cartagena, developing critical "tracking" skills that bridge ethnographic practice with cultural theory. Preparation for fieldwork includes an on-campus curriculum, organized around Cartagena and Las Palmas, and sessions with Yale Ethnography Hub faculty, covering different methodologies. As part of this broader programming, the curriculum delves into trans-Atlantic migrations from the Middle East, South Asia, and Africa that have transformed port cities, labor and aesthetic practices, class-making racial formations, and global geopolitics. After recess, the course shifts toward independent work, as students synthesize field-collected data and insights into a collaborative multimodal group project and individual ethnographic papers. Interested students must apply by November 1st via the course website. Students may withdraw by the university deadlines in April. Prerequisite: Conversational and reading proficiency in Spanish.

Readings are in English and Spanish, with assignments accepted in either language. HU

Yoruba (YORU)

YORU 1110a, Beginning Yorùbá I Oluseye Adesola
Training and practice in speaking, listening, reading, and writing. Initial emphasis is on the spoken aspect, with special attention to unfamiliar consonantal sounds, nasal vowels, and tone, using isolated phrases, set conversational pieces, and simple dialogues. Multimedia materials provide audio practice and cultural information. L1 1½ Course cr

YORU 1130a, Intermediate Yorùbá I Oluseye Adesola
Refinement of students' speaking, listening, reading, and writing skills. More natural texts are provided to prepare students for work in literary, language, and cultural studies as well as for a functional use of Yorùbá. After YORU 120. L3 1½ Course cr

YORU 1150a, Advanced Yorùbá I Oluseye Adesola
An advanced course intended to improve students' aural and reading comprehension as well as speaking and writing skills. Emphasis on acquiring a command of idiomatic usage and stylistic nuance. Study materials include literary and nonliterary texts; social, political, and popular entertainment media such as movies and recorded poems (*ewì*); and music. After YORU 140. L5

YORU 1180a, Advanced Topics in Yorùbá Literature and Culture Oluseye Adesola
Designed for students with superior proficiency in Yorùbá who have an interest in topics not otherwise covered by existing courses. Development of language proficiency to the level of an educated native speaker. Discussion of advanced readings on Yorùbá philosophy, history, literature, and culture. L5

Zulu (ZULU)

ZULU 1110a, Beginning isiZulu I Nandipa Sipengane
A beginning course in conversational isiZulu, using Web-based materials filmed in South Africa. Emphasis on the sounds of the language, including clicks and tonal variation, and on the words and structures needed for initial social interaction. Brief dialogues concern everyday activities; aspects of contemporary Zulu culture are introduced through readings and documentaries in English. L1 1½ Course cr

ZULU 1120b, Beginning isiZulu II Staff
Development of communication skills through dialogues and role play. Texts and songs are drawn from traditional and popular literature. Students research daily life in selected areas of South Africa. Prerequisite: ZULU 110. L2 1½ Course cr

ZULU 1130a, Intermediate isiZulu I Nandipa Sipengane
Development of fluency in speaking, listening, reading, and writing, using Web-based materials filmed in South Africa. Students describe and narrate spoken and written paragraphs. Review of morphology; concentration on tense and aspect. Materials are drawn from contemporary popular culture, folklore, and mass media. After ZULU 120. L3 1½ Course cr

ZULU 1140b, Intermediate isiZulu II Staff
Students read longer texts from popular media as well as myths and folktales. Prepares students for initial research involving interaction with speakers of isiZulu in South Africa and for the study of oral and literary genres. After ZULU 130. L4 1½ Course cr

* **ZULU 1150a, Advanced isiZulu I** Nandipa Sipengane
Development of fluency in using idioms, speaking about abstract concepts, and voicing preferences and opinions. Excerpts from oral genres, short stories, and television dramas. Introduction to other South African languages and to issues of standardization, dialect, and language attitude. After ZULU 140. Course includes students from Cornell University via videoconference. L5

* **ZULU 1160b, Advanced isiZulu II** Staff
Readings may include short stories, a novel, praise poetry, historical texts, or contemporary political speeches, depending on student interests. Study of issues of language policy and use in contemporary South Africa; introduction to the Soweto dialect of isiZulu. Students are prepared for extended research in South Africa involving interviews with isiZulu speakers. After ZULU 150. Course includes students from Cornell University via videoconference. L5

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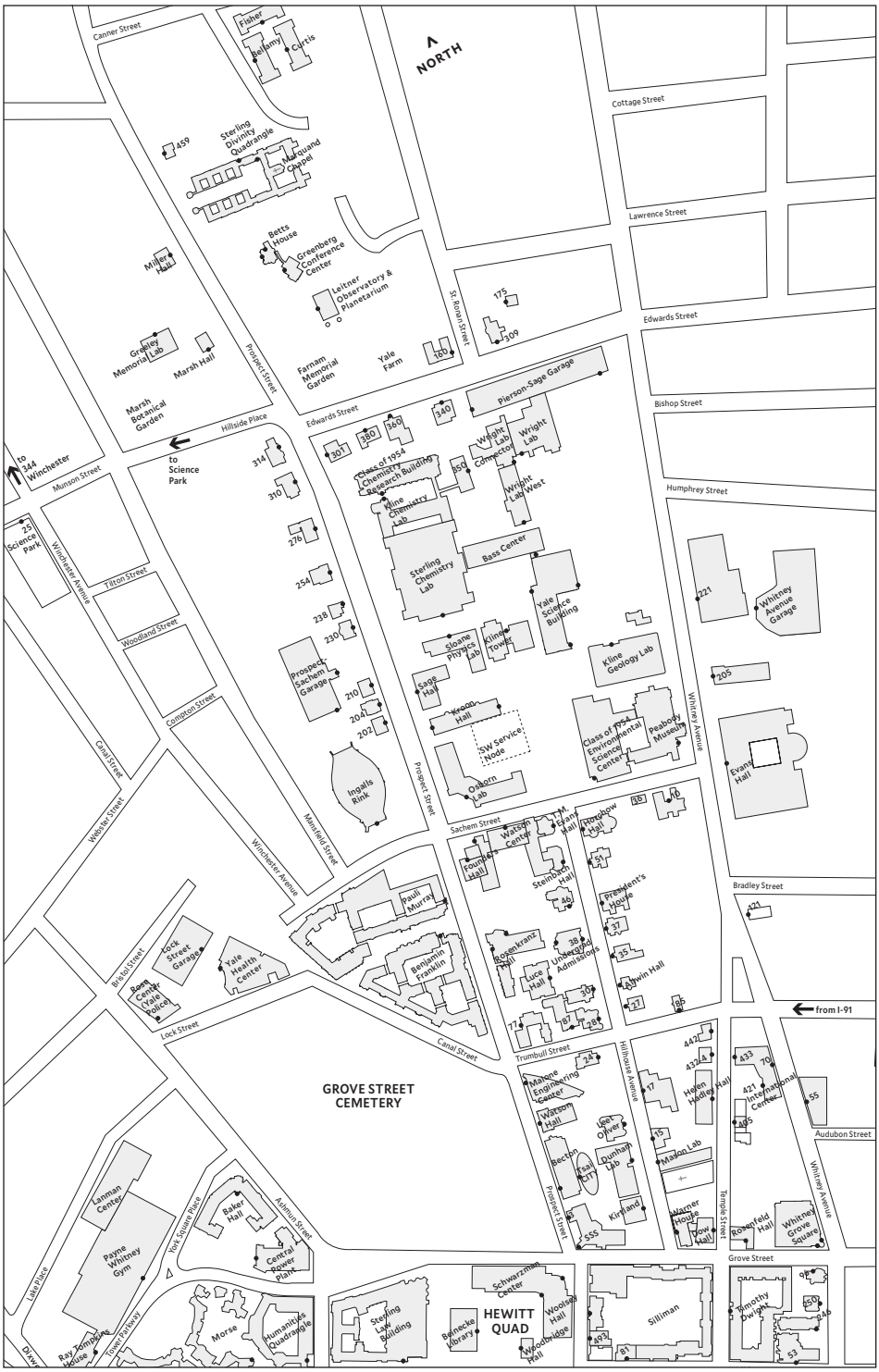

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YALE UNIVERSITY CAMPUS SOUTH & YALE MEDICAL CENTER

The university is committed to basing judgments concerning the admission, education, and employment of individuals upon their qualifications and abilities and seeks to attract to its faculty, staff, and student body qualified persons from a broad range of backgrounds and perspectives. Additionally, in accordance with Yale's Policy Against Discrimination and Harassment (https://your.yale.edu/policies-procedures/policies/9000-yale-university-policy-against-discrimination-and-harassment), Yale does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's sex, sexual orientation, gender identity or expression, race, color, national or ethnic origin, religion, age, disability, status as a special disabled veteran, protected veteran status, or other protected classes as set forth in Connecticut and federal law. Inquiries concerning this policy may be referred to the Office of Institutional Equity and Access, 203.432.0849; equity@yale.edu. For additional information, please visit https://oiea.yale.edu.

Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal financial assistance. Questions regarding Title IX may be referred to the University's Title IX Coordinator, Elizabeth Conklin, at 203.432.6854 or at titleix@yale.edu, or to the U.S. Department of Education, Office for Civil Rights, 8th Floor, 5 Post Office Square, Boston MA 02109-3921; tel. 617.289.0111, TDD 800.877.8339, or ocr.boston@ed.gov. For additonal information, including information on Yale's sexual misconduct policies and a list of resources available to Yale community members with concerns about sexual misconduct, please visit https://smr.yale.edu.

In accordance with federal and state law, the University maintains information on security policies and procedures and prepares an annual campus security and fire safety report containing three years' worth of campus crime statistics and security policy statements, fire safety information, and a description of where students, faculty, and staff should go to report crimes. The fire safety section of the annual report contains information on current fire safety practices and any fires that occurred within on-campus student housing facilities. Upon request to the Yale Police Department at 203.432.4400, the University will provide this information to any applicant for admission, or to prospective students and employees. The report is also posted on Yale's Public Safety website; please visit http://publicsafety.yale.edu.

In accordance with federal law, the University prepares an annual report on participation rates, financial support, and other information regarding men's and women's intercollegiate athletic programs. Upon request to the Director of Athletics, PO Box 208216, New Haven CT 06520-8216, 203.432.1414, the University will provide its annual report to any student or prospective student. The Equity in Athletics Disclosure Act (EADA) report is also available online at http://ope.ed.gov/athletics.

For all other matters related to admission to Yale College, please write to the Office of Undergraduate Admissions, Yale University, PO Box 208234, New Haven CT 06520-8234; 203.432.9300; http://admissions.yale.edu.

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