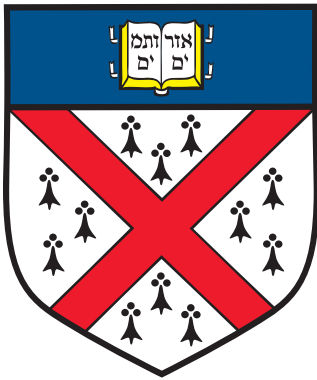


Yale College
Programs of Study
Fall and Spring Terms

2021—2022



BULLETIN OF YALE UNIVERSITY

Series 117 Number 1 May 5, 2021

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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.

Yale College
Programs of Study
Fall and Spring Terms
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KEY TO COURSE LISTINGS

AFAM	Course subjects are listed by three- or four-letter abbreviations in capitals. See the complete list of Subject Abbreviations.
MATH 112a or b	The letters “a” and “b” after a course number denote fall- and spring-term courses, respectively. A course designated “a or b” is the same course given in both terms.
Staff	Staff is listed when an instructor has yet to be assigned to a course. Refer to Yale Course Search (Http://courses.yale.edu) for individual section instructors.
Prerequisite: MATH 120	Prerequisites and recommendations are listed at the end of the course description.
L5, HU	Language courses are designated L ₁ (first term of language study), L ₂ (second term), L ₃ (third term), L ₄ (fourth term), or L ₅ (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://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://catalog.yale.edu/ycps/academic-regulations/reading-period-final-examination-period/) in the Academic Regulations.
[ASTR 320]	Courses in brackets are not offered during the current year but are expected to be given in the succeeding academic year.
*HIST 012	All seminars are starred and enrollment is limited. The instructor’s permission may be required.
ITAL 310/LITR 183	A course with multiple titles, i.e., with two or more departments in the title line, counts toward the major in each department where it appears.
TR	The abbreviation “TR” denotes a literature course with readings in translation.
YC English: 18th/19th Century	Courses with department-specific designations are applied toward the requirements of certain majors. See the program descriptions of the relevant majors.
HIST 130J, MCDB 201L	A capital J or L following the course number denotes a History departmental seminar or a science laboratory, respectively.

BUILDING ABBREVIATIONS

AKW	Arthur K. Watson Hall	KGL	Kline Geology Laboratory
BASS	Bass Center for Molecular and Structural Biology	KRN	Kroon Hall
BASSLB	Bass Library	L	Lawrance Hall
BATTEL	Battell Chapel	LC	Linsly-Chittenden Hall
BCMM	Boyer Center for Molecular Medicine	LEPH	Laboratory of Epidemiology and Public Health
BCT	Becton Engineering and Applied Science Center	LFOP	Leitner Family Observatory and Planetarium
BF	Benjamin Franklin College	LGH	Abby and Mitch Leigh Hall
BK	Berkeley College	LOM	Leet Oliver Memorial Hall
BM	Charles W. Bingham Hall	LORIA	Jeffrey H. Loria Center
BML	Brady Memorial Laboratory	LUCE	Henry R. Luce Hall
BR	Branford College	LWR	Lanman-Wright Memorial Hall
BRBL	Beinecke Rare Book and Manuscript Library	MC	Morse College
BRW35	35 Broadway	MEC	Malone Engineering Center
C	Connecticut Hall	ML	Mason Laboratory
CCAM	Center for Collaborative Arts and Media	MY	Pauli Murray College
CO451	451 College Street	OML	Osborn Memorial Laboratories
CO493	493 College Street	PC	Pierson College
CRB	Class of 1954 Chemistry Research Building	PH	Phelps Hall
CSC	Child Study Center	PR77	77 Prospect Street
D	Durfee Hall	PWG	Payne Whitney Gymnasium
DAVIES	Davies Auditorium, Becton Center	RDH	Rudolph Hall
DC	Davenport College	RKZ	Rosenkranz Hall
DL	Dunham Laboratory	S	Sage Hall
DOW	Dow Hall	SA10	10 Sachem Street
EM	Edwin McClellan Hall	SCL	Sterling Chemistry Laboratory
ES	Ezra Stiles College	SDQ	Sterling Divinity Quadrangle
ESC	Class of 1954 Environmental Science Center	SHM	Sterling Hall of Medicine
EVANS	Edward P. Evans Hall	SLB	Sterling Law Building
F	Farnam Hall	SM	Silliman College
GH	Grace Hopper College	SMH	Sprague Memorial Hall
GML	Greeley Memorial Laboratory	SML	Sterling Memorial Library
GRN	Holcombe T. Green, Jr., Hall	SPL	Sloane Physics Laboratory
HEN	Hendrie Hall	SSS	Sheffield-Sterling-Strathcona Hall
HLH17	17 Hillhouse Avenue	STOECK	Stoeckel Hall
HLH28	28 Hillhouse Avenue	SY	Saybrook College
HQ	Humanities Quadrangle	TAC	The Anlyan Center
JE	Jonathan Edwards College	TC	Trumbull College
K	Kirtland Hall	TD	Timothy Dwight College
KCL	Kline Chemistry Laboratory	TM432	432 Temple Street
		UT	University Theatre
		V	Vanderbilt Hall
		W	Welch Hall
		WALL53	53 Wall Street
		WALL81	81 Wall Street

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

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). Dates for Fall 2021 are subject to change. Information for the Spring 2022 term will be updated as soon as information is available. Check back regularly. To view dates for Spring term 2021 check the 2020–2021 *Yale College Programs of Study*. *Calendar updated April 6, 2021.*

FALL 2021

All dates are subject to change. Additional information will be added as it becomes available.

May 3	M	Fall 2021 course registration opens for currently enrolled Yale College students.
May 21	F	Spring 2021 Senior grades due by 5:00 p.m.
May 28	F	Spring 2021 grades due for all returning students by 5:00 p.m.
June 4	F	Fall 2021 course registration closes for currently enrolled Yale College students.
Sept. 1	W	Fall-term classes begin, 8:20 a.m.
Sept. 3	F	Friday classes do not meet; Monday classes meet instead.
Sept. 6	M	Labor Day; classes do not meet.
Sept. 8	W	All students planning to complete degree requirements at the end of the fall term must file a petition by this date.
Sept. 15	W	Withdrawal from Yale College on or before this date entitles a student to a full rebate of fall-term tuition. See Undergraduate Regulations.
Sept. 15	W	Final deadline to apply for fall-term Leave of Absence. See Leave of Absence, Deferral, Withdrawal, and Reinstatement.
Sept. 23	Th	Last day to withdraw from a fall first half-term course without the course appearing on the transcript.
Sept. 25	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. 15	F	Last day of courses offered in the first half of the fall term.
Oct. 15	F	Last day to withdraw from a course offered in the first half of the fall term.
Oct. 15	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. 18	M	Fall second half-term classes begin.
Oct. 19	T	October recess begins after last class.
Oct. 25	M	Classes resume, 8:20 a.m.
Oct. 29	F	Midterm.
Oct. 29	F	Last day to withdraw from a fall full-term course without the course appearing on the transcript.
Oct. 29	F	Deadline to apply for double credit in a single-credit course.

Oct. 29	F	Withdrawal from Yale College on or before this date entitles a student to a rebate of one-quarter of the term's tuition.
Nov. 11	Th	Last day to withdraw from a fall second half-term course without the course appearing on the transcript.
Nov. 19	F	November recess begins after last class.
Nov. 29	M	Classes resume; 8:20 a.m.
Dec. 10	F	Classes end; reading period begins.
Dec. 10	F	Last day to convert from a letter grade to the Cr/D/F option in a full-term course and/or a course offered in the second half of the Fall term.
Dec. 10	F	Last day to withdraw from a full-term course.
Dec. 10	F	Last day to withdraw from a course offered in the second half of the fall term.
Dec. 16	Th	Final examinations begin, 7:00 p.m.
Dec. 22	W	Final examinations end, 5:30 p.m.; winter recess begins.
Jan. 4	T	Final grades due.

SPRING 2022

Dates provided are provisional. Confirmed spring 2022 dates will be provided as soon as they are announced.

Jan. 18	T	Spring-term classes begin.
Apr. 29	F	Classes end, 5:30 p.m.; reading period begins.

SUMMER SESSION 2022

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.

YALE COLLEGE ADMINISTRATIVE OFFICERS

ADMINISTRATIVE OFFICERS

Peter Salovey, Ph.D., President of the University

Scott Strobel, Ph.D., Provost of the University

Marvin Chun, Ph.D., Dean of Yale College

Tamar S. Gendler, Ph.D., Dean of the Faculty of Arts and Sciences

Jane Edwards, Ph.D., Senior Associate Dean; Dean of International and Professional Experience

Burgwell Howard, M.Ed., Senior Associate Dean; Associate Vice President of Student Engagement

Melanie Boyd, Ph.D., Senior Associate Dean; Dean of Student Affairs

Paul McKinley, M.F.A., Senior Associate Dean of Strategic Initiatives and Communications

Mark J. Schenker, Ph.D., Senior Associate Dean; Dean of Academic Affairs

Pamela Schirmeister, Ph.D., Senior Associate Dean; Dean of Undergraduate Education

Sandy Chang, M.D., Ph.D., Associate Dean for Science and QR Education

Jeanine Dames, J.D., Associate Dean; Director, Office of Career Strategy

Jeanne Follansbee, Ph.D., Associate Dean; Dean of Yale Summer Session

Kathryn Krier, M.F.A., Associate Dean for the Arts

George G. Levesque, Ph.D., Associate Dean; Dean of Academic Programs

Petronella Van Deusen-Scholl, Ph.D., Associate Dean for Foreign Language Education; Director of the Center for Language Study

Eileen M. Galvez, M.Ed., Assistant Dean; Director of La Casa Cultural

Janay M. Garrett, M.A., Assistant Dean of Student Affairs

Alfred E. Guy, Jr., Ph.D., Assistant Dean; Director of the Yale College Writing Center

Matthew Makomenaw, Ph.D., Assistant Dean; Director of the Native American Cultural Center

Kelly McLaughlin, M.A., Assistant Dean of Assessment; Deputy Director and Director of Study Abroad

Risë Nelson, M.A., Assistant Dean; Director of the Afro-American Cultural Center

Hannah Peck, M.Div., Assistant Dean of Student Affairs

Rachel Russell, M.Ed., Assistant Dean of Student Affairs

Risa Sodi, Ph.D., Assistant Dean; Director of Advising and Special Programs

Joliana Yee, Ph.D., Assistant Dean; Director of Asian American Cultural Center

Joel Silverman, Ph.D., Director of Academic and Educational Affairs

Ksenia Sidorenko, M.Phil., Title IX Coordinator

Emily Shandley, B.A., University Registrar

DEANS OF THE RESIDENTIAL COLLEGES

Berkeley College, Brianne Bilsky, Ph.D.
Branford College, Sarah E. Insley, Ph.D.
Davenport College, Ryan A. Brasseaux, Ph.D.
Timothy Dwight College, Sarah Mahurin, Ph.D.
Jonathan Edwards College, Christina Ferando, Ph.D.
Benjamin Franklin College, Jessie Royce Hill, M.S.
Grace Hopper College, David Francis, Ph.D.
Morse College, Angela Gleason, Ph.D.
Pauli Murray College, Alexander Rosas, J.D., Ph.D.
Pierson College, Jorge Torres, J.D.
Saybrook College, Ferentz Lafargue, Ph.D.
Silliman College, Leanna Barlow, Ph.D.
Ezra Stiles College, Murphy Temple, Ph.D.
Trumbull College, Surjit Chandhoke, Ph.D.

ADMISSIONS AND FINANCIAL AID OFFICERS

Jeremiah Quinlan, M.B.A., Dean of Undergraduate Admissions and Financial Aid
Margit A. Dahl, B.A., Director of Undergraduate Admissions
Scott Wallace-Juedes, B.A., Director of Undergraduate Financial Aid
Caesar Storlazzi, M.M., University Director of Financial Aid
Kerry Worsencroft, B.S., Deputy University Director of Financial Aid

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 (o) 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.

Final examination dates and times for 2021–2022 are:

Fall	9 a.m.	2 p.m.	7 p.m.	Spring	9 a.m.	2 p.m.	7 p.m.
16 Dec. Th			(63)	TBA			(61)
17 Dec. F	(61)	(36)		TBA	(22)	(26)	
18 Dec. Sa	(69)	(27)	(33)	TBA	(64)	(34)	(37)
19 Dec. Su		(24)	(65)	TBA		(32)	(31)
20 Dec. M	(31)	(32)	(64)	TBA	(63)	(33)	(23)
21 Dec. Tu	(37)	(34)	(22)	TBA	(27)	(69)	(36)
22 Dec. W	(23)	(26)		TBA	(65)	(24)	

A student who in a given term elects two courses with the same examination group number will be charged \$35 for a makeup examination. (See Academic Regulations, section H, Completion of Course Work, “Postponement of Final Examinations.”)

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
BENG	Biomedical Engineering
BIOL	Biology
BRST	British Studies
BURM	Burmese
CENG	Chemical Engineering
CGSC	Cognitive Science
CHEM	Chemistry
CHLD	Child Study Center
CHNS	Chinese
CLCV	Classical Civilization
CLSS	Classics
CPAR	Computing and the Arts
CPSC	Computer Science
CSEC	Computer Science and Economics
CZEC	Czech
DEVN	DeVane Lecture Course
DRST	Directed Studies
DUTC	Dutch
E&EB	Ecology and Evolutionary Biology
EALL	East Asian Languages and Literatures
EAST	East Asian Studies
ECON	Economics
EDST	Education Studies
EENG	Electrical Engineering
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
F&ES	Forestry & Environmental Studies
FILM	Film and Media Studies
FNSH	Finnish
FREN	French
GLBL	Global Affairs
GMAN	Germanic Languages and Literatures
GREK	Ancient Greek
HEBR	Hebrew
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
JAPN	Japanese
JDST	Judaic Studies
KHMR	Khmer
KREN	Korean
LAST	Latin American Studies
LATN	Latin
LING	Linguistics
LITR	Comparative Literature
MATH	Mathematics
MB&B	Molecular Biophysics and Biochemistry
MCDB	Molecular, Cellular, and Developmental Biology
MENG	Mechanical Engineering
MGRK	Modern Greek
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 and East European 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
STCY	Study of the City
SWAH	Kiswahili
TAML	Tamil
TBTN	Classical Tibetan
THST	Theater and Performance Studies
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. In the left column are the criteria for granting acceleration credit based on AP scores. 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.

Two is the maximum number of acceleration credits that can be earned in any subject.

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 2020–2021 or are expected to be offered in 2021–2022. 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 2025.

	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 174, CHEM 175, CHEM 220, CHEM 221, CHEM 230, CHEM 252, CHEM 332, or CHEM 333.	If 2 acceleration credits awarded: 2 lost by CHEM 161, CHEM 163, or CHEM 165, or any course numbered CHEM 109 or lower.
Computer Science	None	1 credit for CPSC 201 or CPSC 223; 2 credits for CPSC 323.	If 1 acceleration credit awarded: 1 lost by CPSC 112. If 2 awarded: 2 lost by CPSC 112, 1 lost by CPSC 201 or CPSC 223.
Economics	None	1 credit in microeconomics for ECON 121 or ECON 125; 1 credit in macroeconomics for ECON 122 or ECON 126.	Microeconomics credit lost by ECON 108, ECON 110, or ECON 115; macroeconomics credit lost by ECON 111 or ECON 116.

English	1 credit for 5 on either AP English Lang and Comp or AP English Lit and Comp tests.	1 credit for ENGL 120 or ENGL 121; 1 credit for 1 term, 2 credits for 2 terms of ENGL 125, ENGL 126, ENGL 127, ENGL 128, ENGL 129, ENGL 130, or DRST 001, DRST 002.	ENGL 114, ENGL 115
Foreign 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.
History of Art	1 credit for 5 on AP test in Art History.	None	None
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 115, MATH 116, or MATH 118; 2 credits for 120 or higher-numbered courses.	If 2 acceleration credits awarded: 2 lost by any course numbered MATH 112 or lower; 1 lost by MATH 115, MATH 116, or MATH 118. If 1 awarded: 1 lost by any course numbered 112 or lower.
Music	1 credit for 5 on AP Music Theory test.	None	None

Physics

<p>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.</p>	<p>2 credits for PHYS 260, PHYS 261 or for course numbered PHYS 400 or higher.</p>	<p>If 1 acceleration credit awarded, 1 lost, and if 2 acceleration credits awarded, 2 lost, by any course numbered PHYS 201 or lower.</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------

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.

A MESSAGE FROM THE DEAN OF YALE COLLEGE

We officially call this publication the *Yale College Programs of Study*, but generations of students and faculty have known it simply as the blue book. A companion to the roughly 2,000 courses to be offered in Yale College in 2021–2022, the blue book 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 the blue book 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.

Marvin M. Chun, Ph.D.

Dean of Yale College

Richard M. Colgate Professor of Psychology; Neuroscience; Cognitive Science

I. YALE COLLEGE

The Undergraduate Curriculum

Yale College, founded in 1701, is a coeducational undergraduate institution offering instruction in the liberal arts and sciences to around 6,200 students. The College is the oldest and the largest school of the University, which also comprises the Graduate School of Arts and Sciences and ten professional schools.

Yale College offers a liberal arts education, one that aims to cultivate a broadly informed, highly disciplined intellect without specifying in advance how that intellect will be used. Such an approach to learning regards college as a phase of exploration, a place for the exercise of curiosity, and an opportunity for the discovery of new interests and abilities. The College does not seek primarily to train students in the particulars of a given career, although some students may elect to receive more of that preparation than others. Instead, its main goal is to instill knowledge and skills that students can bring to bear in whatever work they eventually choose. 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.

To ensure that study is neither too narrowly focused nor too diffuse, the College stands behind the principle of distribution of studies as strongly as it supports the principle of concentration. It requires that study be characterized, particularly in the earlier years, by a reasonable diversity of subject matter and approach, and in the later years, by concentration in one of the major programs or departments. 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. People who fail to develop these skills at an early stage unknowingly limit their futures. In each skill, students are required to travel some further distance from where they were in high school so that each competence matures and deepens. The best high school writer is still not the writer he or she could be; students who do not use their quantitative or language skills in college commonly lose abilities they once had and can graduate knowing less than when they arrived.

In a time of increasing globalization, both academic study of the international world and firsthand experience of foreign cultures are crucial. No Yale College student can afford to remain ignorant of the forces that shape our world. Yale College urges all of its students to consider a summer, a term, or a year abroad sometime during their college careers.

A student working toward a bachelor’s degree takes four or five courses each term and normally receives the B.A. or B.S. degree after completing thirty-six term courses or their equivalent in eight terms of enrollment. To balance structure with latitude and to achieve a balance of breadth and depth, a candidate for the bachelor’s degree is required, in completing the thirty-six term courses, to fulfill the distributional requirements described in this bulletin, as well as the requirements of a major program.

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. By themselves, the distributional requirements constitute a minimal education, not a complete one. They are to be embraced as starting points, not goals.

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. But independently of any specific application, study of these subjects teaches understanding of and delight in 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 inquiry, experimental analysis, and firsthand problem solving inextricably linked to scientific inquiry give rise to new 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 of the natural and physical worlds often hidden from casual observation but which, once revealed, lend richness to everyday life.

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 the academic programs in engineering. 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 advanced research in most disciplines. As students strengthen their writing skills, they develop 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. In the sophomore year, students should discuss their schedule with their chosen college adviser.

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, 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.

Multidisciplinary Academic Programs

Multidisciplinary Academic Programs provide opportunities for Yale College students to examine pressing social challenges from a variety of disciplinary perspectives among a community of students and faculty who have shared interests. Students from any major can apply to these programs, and faculty from across the University participate in them. Each program focuses centrally on a distinct and different set of issues, but they all share common features, including a core curriculum and opportunities for practical experience that allow students to combine theory and practice, applying what they have learned in the classroom and in their research. Students may apply to more than one program, but they may enroll in only one.

EDUCATION STUDIES

The Education Studies Program comprises an interdisciplinary cohort of scholars who are interested in education practice, policy, and/or research. Each scholar completes electives within the Education Studies curriculum, a summer or academic-year field experience, and a senior capstone seminar and thesis-equivalent project. Education Studies Scholars also explore educational topics through symposia led by Yale faculty and advising relationships with mentors. Students may apply to the Education Studies Undergraduate Scholars program in their sophomore year. The prerequisite for applying is EDST 110. For more information, see the program website.

ENERGY STUDIES

The Energy Studies Program is designed to provide select undergraduates with the broad knowledge and skills needed for advanced studies, leadership, and success in energy-related fields. The curriculum is divided in three tracks—Energy Science and Technology, Energy and Environment, and Energy and Society—and requires the completion of six graded term courses covering the three tracks, plus a senior capstone project. Admission to the Energy Studies Undergraduate Scholars program is by application in the fall term of sophomore year. For more information, see the program website.

GLOBAL HEALTH STUDIES

The Global Health Studies Program prepares students to critically engage with global health and its multifaceted issues in present-day 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 who apply to the program, typically in the fall of their sophomore year, become Global Health Scholars. They complete interdisciplinary course work across six global health competency areas to gain a broad understanding of global health research, practice, and leadership. In the summer after their junior year, Scholars can apply for funding support to pursue optional experiential learning projects (such as internships, archival work, or field-based research). During their senior year, they enroll in a colloquium course in order to meaningfully integrate the skills and knowledge acquired throughout the program. For more information, see the program website.

HUMAN RIGHTS STUDIES

The Human Rights Studies Program seeks to equip students with an academic foundation from which to engage meaningfully with human rights scholarship and practice. The program is based on an understanding that human rights constitutes a rich and interdisciplinary field of study, drawing on bodies of work in history, literature, economics, political science, philosophy, anthropology, law, and area studies. The program provides students with relevant analytical, conceptual, and practical skills; connects students to affiliated faculty and peers; supports student research projects and internship opportunities; and offers career guidance on post-college opportunities related to human rights. Students interested in admission to the Human Rights Studies Program must apply in the fall semester of their sophomore year. To fulfill the requirements of the program, students must complete a gateway course (HMRT 100), four electives, and a capstone seminar (HMRT 400). For more information, see the program website.

Certificate Programs

Central to the mission of Yale College is ensuring a broad education rooted in the liberal arts. That education should provide both breadth and depth across a wide array of disciplines, and it should 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 disciplines-based

and skills-based certificates. A certificate is not 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 in Yale College: Advanced Language Certificates, Skills-Based Certificates, and Interdisciplinary Certificates.

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 Center for International and Professional Experience 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 through Yale Study Abroad to earn credit from eligible outside summer study abroad programs. 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 Arrangements. Additional information is available from the Yale Study Abroad office.

YALE IN LONDON

The Yale in London program offers spring-term courses in British humanities and social sciences, including history, history of art, architecture, sociology, literature, and drama at the Paul Mellon Centre for Studies in British Art, located in central London. The program is open to undergraduates, carries full Yale course credit, and counts as a term of enrollment. Instruction is designed to take advantage of the cultural resources of London and its environs, with regular field trips (including overnight stays) to museums, historic houses, and other sites of interest. Accommodations are provided for students in shared apartments. Further information is available on the program website, or 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 vary from year to year and cover topics in humanities and social sciences, including history, history of art, architecture, sociology, literature, and drama. The courses are open to undergraduates 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. As with the spring program, the summer sessions take advantage of the cultural resources of London and its environs, and include overnight field trips. Accommodations are provided. Course descriptions and further information are available on the program website, or 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.

JACKSON INSTITUTE FOR GLOBAL AFFAIRS

The Jackson Institute's mission is to inspire and prepare Yale students for global citizenship and service. The Institute administers the undergraduate major in Global Affairs and offers a number of courses that are open to students in Yale College, including GLBL 101, Gateway to Global Affairs. The Institute also administers several undergraduate fellowship competitions available to any Yale College student wishing to conduct independent research abroad, language study, or an internship related to international affairs.

Each year the Jackson Institute hosts Senior Fellows, leading practitioners and experts in global affairs who teach courses, give public lectures, and are available to consult with students on their career plans. The Jackson Institute's career development office hosts events throughout the year that are for and open to Global Affairs majors contemplating careers in public service and other areas of global affairs.

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 (formerly known as the DSA) 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 most 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. It would be premature – and unrealistic – for beginning students to map out a fixed schedule of courses for the subsequent four years, yet it is advisable that they 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.

Yale College does not prescribe a set program of study, in the belief that students who select their own courses are inevitably more engaged with them. As students shape their educational goals, it is important that they seek informed advice. For incoming students who have not yet developed relationships with academic advisers on campus, Yale College furnishes a constellation of advising linked to the residential colleges. As students progress in their studies, usually by sophomore year, they 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, as is the staff at the Center for International and Professional Experience (CIPE), whose divisions – Study Abroad, Fellowship Programs, the Office of Career Strategy (including the Health Professions Advisory Program), and Yale Summer Session – 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 about fifty additional 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, serve as peer advisers to first-year students. Additional information about advising resources in the residential colleges can 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, can be found in Chapter III. Additional information about advising resources and faculty in a department or program can 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. Additionally, the center houses the Academic Strategies program, which provides information, workshops, and individual mentoring to Yale College students on the skills central to active, empowered learning. 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 drop-in help to students at any stage of writing. 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

Tutoring programs for science (Sc) and quantitative reasoning (QR) courses are offered through the Poorvu Center. The Poorvu Center provides quantitative reasoning and science tutoring for every relevant field in Yale College. Many courses provide their own Course-Based Peer Tutors (CBPTs) who can help students as they work on problem sets or study for exams, and who also can review returned assignments.

Information about CBPTs is available on individual course syllabi and the Canvas website. If a particular course does not have a CBPT or if a student requires more help, the Residential College Math/Science Tutors offer drop-in hours during which any science or quantitative reasoning topic may be addressed. Finally, students who need more individual attention can apply for small-group tutoring. More information on all of these programs can be found on the Poorvu Center website.

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. 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 and works to remove physical and attitudinal barriers to their full participation in the University community. Services include, but are not limited to, reasonable academic, classroom and housing accommodations, alternate format materials, and assistive technology loans. The required first step for a student with a disability is to register with SAS to initiate the process of obtaining disability-related accommodations. Supporting documentation ought to be attached to the registration. Registration with SAS is private. 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 known. At any time during a term, students with a newly diagnosed disability or recently sustained injury requiring accommodations should contact SAS. SAS can be reached at sas@yale.edu or by phone at 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 various Western civilizations and cultures, spanning from ancient Greece to the twentieth century. 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 ten 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.

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. Roughly eighty first-year seminars across a wide range of subjects are offered every year, in both fall and spring terms. Students must apply for these seminars before the beginning of each term. A description of the program and application procedures can be viewed 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. He or she is actively engaged with undergraduate life and serves as an academic mentor through seminars, readings, meetings with students, and other activities. The Francis Writer-in-Residence for 2021–2022 is Anne Fadiman.

RESERVE OFFICERS TRAINING CORPS (ROTC)

Yale hosts both Naval and Air Force ROTC units, 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. 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

The Residential College Seminar program, instituted in 1968, is devoted to the development of innovative courses that fall outside traditional departmental structures. The instructors for the seminar program are drawn from the University community and from the region, including writers, journalists, artists, legal scholars, public health experts, and participants in government and the public sector. The college seminar program encourages innovative courses, and student committees in the residential colleges play a significant role in selecting seminars, but all courses in the program must satisfy standard requirements for academic credit in Yale College and must be approved by the relevant faculty committees that oversee the curriculum. Each residential college sponsors at least one seminar each term. Additional seminars are occasionally sponsored directly by the program and are equally open to students from all residential colleges. Descriptions of the seminars are found on the program website.

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. The Rosenkranz Writer-in-Residence for 2021-2022 is Louise Glück.

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 brings a distinguished writer to campus each semester to teach an advanced journalism seminar, ENGL 467. 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 a Yale Journalism Scholar, a distinction that provides access to summer support for internships, career counseling with a journalism specialist, and invitations to meet professional journalists at events both on and off campus. 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 strikes, work stoppages, or job actions. In the face of such events, the University may, at its sole discretion, provide substitute services and programs or appropriate refunds. The decision to suspend services and programs 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. 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.

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 M, 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.

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.

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. They 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. During the summer after each academic year, the University Registrar's Office 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. The most common paths to fulfillment of the language distributional requirement are illustrated in the chart at the end of this section.

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 in French, German, Italian, Latin, or Spanish, and who present scores of 5, are recognized as having completed the intermediate level of study. Scores of 6 or 7 on the International Baccalaureate Advanced-Level examination are also accepted as evidence of intermediate-level accomplishment. Students at this level fulfill the language distributional requirement by completing one course designated L5. Alternatively, they may successfully complete one or more courses in a different language at least through the level designated L2.

Students who have studied a language before matriculating at Yale but who have not achieved a score of 5 on the Advanced Placement test in French, German, Italian, Latin, or Spanish must take a placement test offered by the appropriate

language department or, for languages in which no departmental placement test is offered, consult the appropriate director of undergraduate studies (DUS). Dates and times of placement tests are given in the *Calendar for the Opening Days of College* and on the Center for Language Study website. 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 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 114, 115, 120, 121, or 450. 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 foreign 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 foreign-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 director of undergraduate studies 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. Study abroad may be used in place of L1 and L2 courses only if it is part of a Yale College program, such as Yale

Summer Session. 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, 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, 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.

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.
5. **Independent study courses** A student may not apply any course credit earned through independent study courses toward satisfaction of any of the distributional requirements.
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 matriculation** Course credit earned at Yale before a student's matriculation, either at Yale Summer Session 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 sophomore and junior years, but it may not be applied to the distributional requirements for the first year.
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. Under no circumstances may a student be promoted to sophomore standing without having enrolled for at least one course credit in each of two skills categories (language, quantitative reasoning, writing).
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 must be filed no later than the date of midterm of the fourth term of enrollment; it 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; in no case will a petition be accepted later than the date of midterm 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.

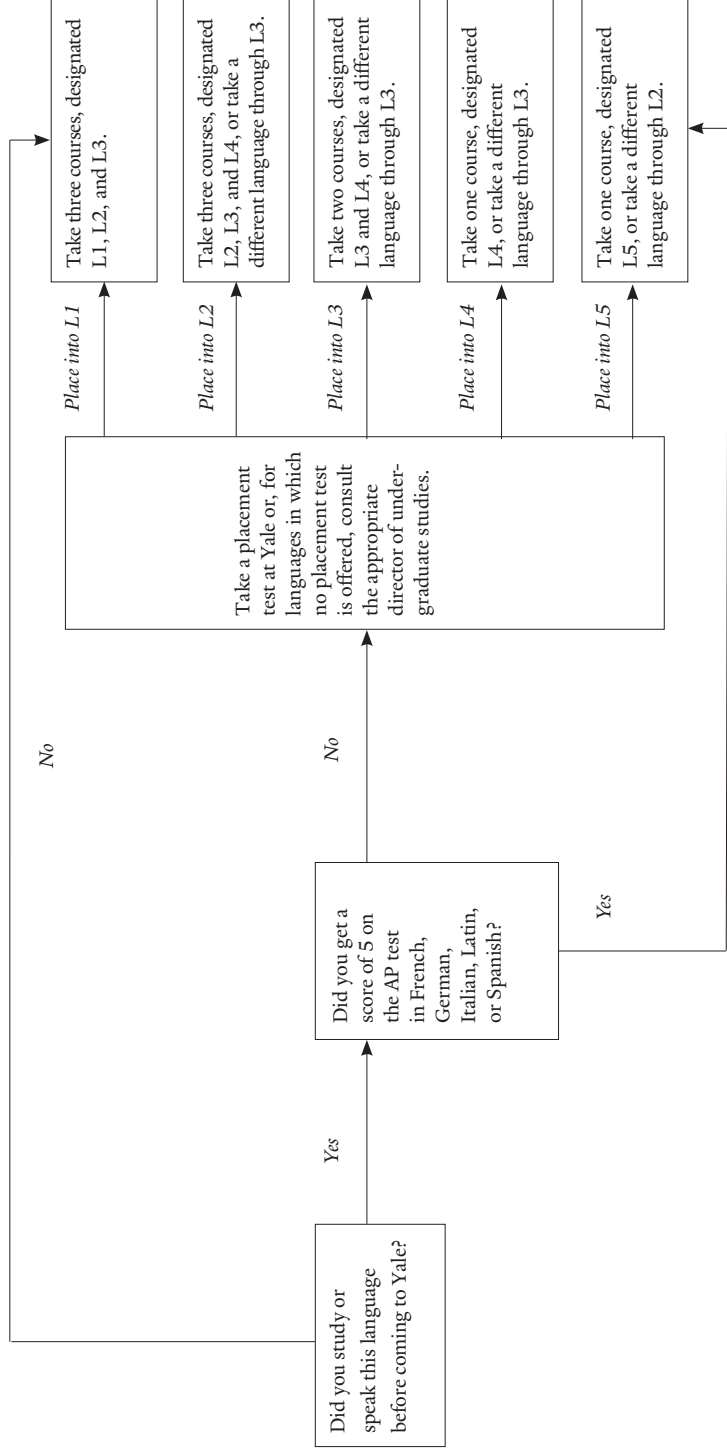
EIGHT TERMS OF ENROLLMENT

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. A student given permission to enroll for a ninth term is not eligible for scholarship assistance from Yale, although other forms of financial aid may be available. 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 L, Transfer Students.

MOST COMMON PATHS TOWARD FULFILLMENT OF THE LANGUAGE REQUIREMENT



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-			

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 a few 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 to the Credit/D/Fail option, with two of these opportunities expiring if unused during their first two terms of enrollment.
4. **Number of courses and course credits in a term** 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. In each term, a student must elect at least two courses, representing at least two course credits, for letter grades or the mark of Pass, in any combination.

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 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 on the Credit/D/Fail basis toward satisfaction of the distributional requirements for the junior year, or toward satisfaction of the distributional requirements for the bachelor's degree.

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, 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 Pass/Fail basis only, and grades for undergraduates in these courses are recorded as CR or F. Such credits are counted in the total earned on the Credit/D/Fail basis that a student is permitted to offer in a term as well as the total offered toward the requirements of a bachelor's degree. Marks of CR in professional school courses are included in the calculations for Distinction in the Major as non-A grades. Marks of CR 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 date on which the student's schedule is due in the term in which the student is enrolling in the course, and should provide sound academic reasons for the exception. In no case will such a petition be accepted later than 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, passing and failing, thus appear on the transcript and 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, even though such grades do not count toward the 36-course-credit requirement for graduation. 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 W (Withdraw) 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 (Withdraw) 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 (Withdraw) 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 (Withdraw) 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 obviously 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 F. 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, medical, academic, or financial reasons, the entry placed in each case on the student's transcript is the word "Withdraw" 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. **Tracks and programs within majors** A transcript may show as a student's major subject only a designation approved for that purpose by the Yale College Faculty; only clearly defined concentrations or tracks of majors may appear on transcripts. The majors approved by the faculty are listed under Majors 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 Student Information System (SIS). 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. The Registrar's Office will provide paper grade reports only upon the specific written request of the student.

9. **Transcript orders** Transcript ordering instructions can be found on the University Registrar's Office website. The charge is \$8 per transcript.

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 student may not enroll in a program of study worth fewer than three course credits in one term, and may not drop below three course credits prior to midterm. A student enrolled for three course credits may withdraw from one course credit between midterm and the first day of the reading period, receiving the neutral designation W (Withdrew) in that course. Similarly, a student enrolled for four or more course credits may withdraw from one or more courses as described above, but at no time may any student carry a schedule of courses that will earn fewer than two course credits and a W in a term.
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 more than

five course credits does not intend to drop any of them. Permission for a program of six course credits will normally not be given to a student who is not in academic good standing.

3. **Seven course credits in a term** A student must petition the Yale College Committee on Honors and Academic Standing 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. 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. Students admitted to the Program for the Simultaneous Award of the Bachelor's and Master's Degrees are not required to seek permission of 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."

E. Course Enrollment

Students may enroll in courses only by entering courses onto their registration worksheet in Yale Course Search 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. **Early 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 will enroll in the prior term; new and returning students will enroll in the month before the term begins. Students who fail to enroll in at least three course credits by the deadline will be charged a late-registration fee of \$50.

2. **Add/drop period** During the first five days of each term, the registration system opens for all students to adjust their course enrollment and select discussion section pairings for lecture courses and lab sections. 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** During the five class days immediately following the add/drop period, students may elect a new course only with the permission of the relevant instructor and the student's residential college dean. Otherwise, the addition of a new course will not be 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 a petition that is accompanied by the written approval of the course instructor and the submission of a course change notice at the office of the residential college dean. 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 will normally be grounds for denial. A fee of \$20 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, as for example in languages or in 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. **Fines for clerical errors** A student who submits a course schedule or course change notice with clerical errors or omissions of data is liable to a fine of \$50.
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 with a small and insignificant overlap in meeting times, the student must supply the residential college dean with the written permission of both instructors at the beginning of the term and must 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. 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 of the instructor to enroll; others require permission of the director of undergraduate studies. It is the responsibility of the student to secure the appropriate permission before enrolling 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 in Yale College, anonymous teaching evaluations are made available through the Yale Student Information System (SIS). Students are expected to participate in this evaluation process for any 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 obviously 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. **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.

13. **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.
14. **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.
15. **Fieldwork** If a student is conducting fieldwork away from the Yale campus, under the supervision of a faculty member, he or she 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. (EST) 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 \$20 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. (EST) on the last day of classes before the reading period, the transcript will record the course and show the neutral designation W (Withdrawn) 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 withdraws from Yale College for medical reasons as certified by Yale Health 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 from Yale College** A student who has withdrawn from Yale College for any reason, including medical, is no longer enrolled. Consequently, as of the date of the withdrawal, such a student cannot continue to attend classes or complete work that was assigned in the term in which the 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** It follows that if a student withdraws from Yale College by midterm, the transcript will not show that the student has been enrolled in any course during that term. If a student withdraws from Yale College after midterm, but before 5 p.m. (EST) 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 withdraws from Yale College for medical reasons 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 hour 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 hour test at the end of term instead of a final examination** Some instructors do not give final examinations of the usual two-and-one-half-hour or three-and-one-half-hour length, but instead terminate their courses with an hour test that is the last in a succession of hour tests administered during the term.

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

For courses that do observe the reading period, the hour 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.

- 9. Senior departmental examinations** In those major programs requiring a senior departmental examination, that examination is scheduled on the two weekdays preceding the final examination period in the fall and spring terms. In a department or program in which a two-day written senior departmental examination is administered on those days, a senior may, with the written consent

of the appropriate instructors, be excused from final examinations in as many as two courses in the major in the term in which he or she takes the departmental examination. In a department or program in which the senior departmental examination takes place on only one of the two scheduled days, a senior may, with the written consent of the instructor, be excused from the final examination in one course in the major in the term in which the departmental examination is taken. If the senior departmental examination takes place before the scheduled days, or if a senior essay or senior project takes the place of the examination, a student may not omit a final examination.

H. Completion of Course Work

SUBMISSION OF COURSE WORK TO INSTRUCTORS

Students in Yale College are expected to take personal responsibility for the timely delivery to their instructors of all course work, including examinations, in the manner and format prescribed by the instructors. In-person submission, either to the instructor or to someone explicitly designated by the instructor, such as a teaching fellow or an administrative assistant, is always the best way to ensure that the work has been received. Students who submit course work in a manner other than in person and directly to an appropriate individual (e.g., place it under a door or in a box in a hallway or send it via electronic means), should—even when that is the method directed by the course instructor—confirm as soon as possible after the submission that the work has been received. Students who must use postal services to submit a course assignment, because they will be unavoidably absent from campus at the time an assignment is due, should ascertain in advance from the instructor the correct mailing address and use receipted mail services to establish the date of mailing.

Instructors are not required to accept course work sent over a computer network to their computer, printer, or email account unless they have explicitly authorized such electronic submission in the course syllabus or have made a special arrangement with the student. Instructors may establish a deadline for electronic submission of a particular assignment different from the deadline for submission of the same assignment on paper.

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; and (3) postponed final examinations. Instructors of courses may, during term time, give permission to make up late or missed work, provided that such work is submitted before the end of term. Only the residential college dean, however, may authorize the late submission of work still incomplete at the end of term, or the postponement of a final examination.

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

The basic responsibility for permitting postponement of work during the term rests with the instructor. However, the residential college dean may give permission for a student to make up work missed or delayed during the term because of an incapacitating illness or incapacitating condition of any kind, 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 because of the observance of religious holy days and because of participation required in intercollegiate varsity athletic events. Only in these cases does a residential college dean have authority to give permission to make up late work during term time. This permission is conveyed by means of a special form from the college dean that the student delivers to the 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 course work must be secured directly from the instructor of the course, since the instructor is the only person who can decide, in the context of the nature and requirements of the course, whether such permission is appropriate. This permission may not, however, extend beyond the end of the term. Permission to submit work still incomplete at the end of term may be granted only by a student's residential college dean. 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 permission to a student to submit work in a course after the end of term. The college dean may give such permission because of an incapacitating illness or incapacitating condition of any kind, because of a serious family emergency, or because of another matter of comparable moment. 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 last day of classes. 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

Problems that may arise from the use of computers, software, and printers normally are not considered legitimate reasons for the postponement of work. A student who uses computers is responsible for operating them properly and completing work on time. (It is expected that a student will 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 technical problems as well as delays caused by heavy demand on shared computer resources in Yale College.

POSTPONEMENT OF FINAL EXAMINATIONS

Only the residential college dean may authorize postponement of a final examination. The residential college dean may give such permission because of an incapacitating illness or incapacitating condition of any kind, because of a family emergency requiring the student's absence from New Haven, or because of another matter of comparable moment. The residential college dean may also authorize such a postponement because of the observance of religious holy days, or because of participation required in an intercollegiate varsity athletic event. 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 final examinations on account of those events. 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 his or her departure to the instructor, or to some other person proctoring the examination, before leaving the room, and must contact Yale Health or the residential college dean as soon as possible thereafter.

Makeup examinations for the fall term are scheduled to take place at 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 are scheduled at the end of the second week of classes in the following fall term. Makeup final examinations are administered by the University Registrar's Office only at these times. 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 make alternative arrangements with the University Registrar's Office in advance of the dates on which makeup final examinations are administered by that office. 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. If an examination is not administered by the registrar, it is the student's responsibility to make arrangements with the instructor to take the makeup examination. In such cases, if a grade is not received by the midterm following the original examination date, the registrar automatically records a grade of F in the course.

No fee will be charged for a makeup examination necessitated by illness, family emergency, the observance of a religious holy day, or participation required in an intercollegiate varsity athletic event. A charge of \$35 will be made for the administration of a makeup examination occasioned by a conflict between two final examinations scheduled at the same time, or three examinations scheduled in the first two days of the examination period, or three final examinations scheduled in consecutive examination periods. Ordinarily there will be a charge of \$35 for makeup examinations authorized for special reasons approved by the Committee on Honors and Academic Standing.

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 he or she has 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. A student 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 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, Leave of Absence, Withdrawal, and Reinstatement, “Reinstatement.” 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.

MAKEUP 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. Leave of Absence, Deferral, Withdrawal, and Reinstatement

LEAVE OF ABSENCE

A student in Yale College who is in academic good standing will normally receive permission, upon petition to the Committee on Honors and Academic Standing through the residential college dean, to take one or two terms of leave of absence, provided that the student departs in academic good standing at the end of a term and returns at the beginning of a term. Such permission will not be granted to first-year students during their first term of enrollment, who instead may request permission to defer for one year and enter the following fall term. See section D, Promotion and Good Standing, “Requirements for Academic Good Standing.” In order that the University may make plans to maintain enrollment at the established level, students desiring leaves of absence are requested to make their intentions known to their residential college deans as soon as possible. Yale College assumes that students who take leaves of absence will inform their parents or guardians in good time 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, though they may do so if they believe that such notification is appropriate.

1. **Petition for a fall-term leave** For a fall-term leave of absence, a student is requested to submit a petition by May 1. Since a student’s plans often change during the summer, however, the Committee on Honors and Academic Standing will ordinarily grant a petition for a leave that is received on or before the fifteenth day of the term in the fall. First-year students may not request a leave during their first term of enrollment, and instead may request to defer for a year.
2. **Petition for a spring-term leave** For a spring-term leave of absence, a student’s petition must be received on or before the fifteenth day of the term in the spring.

3. **Petition for a fall-term deferral** For a fall-term deferral by a first-year student in their first term of enrollment, a student's petition must be received on or before the fifteenth day of that term.
4. **Relinquishing housing** Students considering a leave of absence should be aware that there is a substantial financial penalty for relinquishing on-campus housing after the relevant deadlines for relinquishing such housing. See "Rebates of Undergraduate Charges" under "Financial Services" in the Yale College online publication *Undergraduate Regulations*.
5. **Canceling a leave** A student may cancel a leave of absence for either term as late as the first day of classes in the term for which the leave has been requested. Given this deadline, a student who requests a leave during the first fifteen days of the term may not subsequently cancel that request. However, the deadlines for payment of the term bill and the penalties for late payment apply in such cases. See "Payment of Fees" under "Financial Services" in the Yale online publication *Undergraduate Regulations*.
6. **Total terms of leave** A student is eligible for a total of two terms of leave of absence. These two terms need not be taken consecutively.
7. **Accelerated students** A student taking an accelerated degree by use of acceleration credits who has had two terms of leave of absence may receive a third term of leave if the third 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 section Q, Acceleration Policies.
8. **Returning from a leave** Permission to take a leave of absence normally includes the right to return, with prior notification to the residential college dean but without further application, at the beginning of the term specified in the student's petition to the Committee on Honors and Academic Standing. In the case, however, in which a student achieved eligibility for a leave of absence because of a postponement of a deadline for course work as a result of an identified medical problem, the Yale College Dean's Office may require medical clearance from Yale Health before the student's return from the leave of absence. Such clearance may also be required for a student who had sought and had been granted, on medical grounds, a waiver of the fee for the late relinquishment of housing at the time the leave of absence was requested.
9. **Financial aid** Students taking leaves of absence who have received long-term loans will be sent information about their loan repayment obligations, which in most cases begin six months after the last day of formal enrollment at Yale. A student taking a leave of absence who is receiving financial aid through Yale must consult with a counselor in Student Financial Services before leaving Yale; see "Rebates of Undergraduate Charges" under "Financial Services" in the Yale online publication *Undergraduate Regulations*.
10. **Health coverage** A student on a leave of absence is eligible to retain coverage by Yale Health during the time of the leave, but the student must take the initiative to apply for continued membership in Yale Health by completing an application form and paying the fee for membership. See "Leave of Absence" under "Health Services" in the Yale online publication *Undergraduate Regulations*. Application forms and

details about medical coverage while on leave of absence may be obtained from the Member Services Department of Yale Health.

WITHDRAWAL

There are five types of withdrawal, three of which—academic, medical, and personal—are discussed below. For information on disciplinary and financial withdrawals, consult the Yale online publication *Undergraduate Regulations*. The period of withdrawal for disciplinary reasons is imposed by the Yale College Executive Committee or recommended by the University-Wide Committee on Sexual Misconduct at the time the student's enrollment is suspended.

Regardless of the type of withdrawal, students who have been withdrawn may not stay in residences on campus, attend classes, participate in organized extracurricular activities, or make use of University library, athletic, and other facilities. They may come to campus only upon receiving prior permission from their residential college dean or the Dean of Student Affairs.

ACADEMIC WITHDRAWAL

Students may be dismissed for academic reasons on a variety of grounds; see section I, Academic Penalties and Restrictions, “Dismissal for Academic Reasons.” Students whose withdrawal was 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.

MEDICAL WITHDRAWAL

A withdrawal for medical reasons must be authorized by the director of Yale Health or the chief of the Mental Health and Counseling department, or by their official designees within the Health Center. If a student under the care of a non-Yale Health physician wishes to withdraw for medical reasons, that physician should submit sufficient medical history to the director of Yale Health for a final decision on the recommendation. A student planning to return to Yale should discuss the requirements for reinstatement with the residential college dean or the chair of the Committee on Reinstatement.

Yale College reserves the right to withdraw a student for medical reasons when, on recommendation of the director of Yale Health or the chief of the Mental Health and Counseling department, the dean of Yale College determines that, because of a medical condition, the student is a danger to self or others, the student has seriously disrupted others in the student's residential or academic communities, or the student has refused to cooperate with efforts deemed necessary by Yale Health and the dean to make such determinations. Each case will be assessed individually based on all relevant factors, including, but not limited to, the level of risk presented and the availability of reasonable modifications. Reasonable modifications do not include fundamental alterations to the student's academic, residential, or other relevant communities or programs; in addition, reasonable modifications do not include those that unduly burden university resources. An appeal of such a withdrawal must be made in writing to the dean of Yale College no later than seven days from the effective date of withdrawal. An incident that gives rise to voluntary or mandatory withdrawal may also result in subsequent disciplinary action.

Students whose withdrawal has been authorized as medical by the director of Yale Health or the chief of the Mental Health and Counseling department must normally remain away at least one full term before a return to Yale College, not including the term in which the withdrawal occurred.

WITHDRAWAL FOR PERSONAL REASONS

At any time during the year, a student may withdraw from Yale College for personal reasons. After consulting with the residential college dean, a student wishing to withdraw should write a letter of resignation to the college dean. In consulting with the college dean, a student planning to return to Yale should discuss the requirements for reinstatement. Also, students in academic good standing who fail to register in a term will be withdrawn for personal reasons.

Students whose withdrawal was for personal 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. A student who withdraws from Yale College for personal reasons rather than face disciplinary charges that are pending against that student 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.

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.

REINSTATEMENT

During the time that students who have withdrawn are away from Yale College, the Committee on Reinstatement expects them to have been constructively occupied and to have maintained a satisfactory standard of conduct.

Further requirements depend to some extent on the circumstances of the withdrawal and its duration. Students who are not in academic good standing, i.e., students who withdrew while a term was in progress or who were dismissed for academic reasons, must ordinarily complete the equivalent of at least two term courses, either in Yale Summer Session or at another accredited, four-year, Bachelor's degree-granting college or university, earning grades of A or B. See section I, Academic Penalties and Restrictions. Courses conducted online, whether taken at Yale Summer Session or elsewhere, do not fulfill this reinstatement requirement. In general, such a record of course work is also required of students who withdrew for medical reasons and of any students who have been away from full-time academic work for more than four terms, whether or not they were in academic good standing at the time of their departure, in order to demonstrate that upon return they can satisfactorily complete their academic program. Courses themselves, as well as the institution at which they are taken, should be cleared in advance with the chair of the Committee on Reinstatement. All such course work must be completed no later than the opening of the term to which the student has applied to be reinstated, but no earlier than two years before the date that term begins. Courses completed in fulfillment of reinstatement that are eligible for graduation credit must be applied to the student's Yale College transcript.

While the majority of students who apply for reinstatement do return to Yale College, reinstatement is not guaranteed to any applicant. Since the committee seeks to reinstate only those students who have demonstrated the ability henceforth to remain in academic good standing and thus complete degree requirements within the specific number of terms of enrollment remaining to them, the committee may sometimes advise applicants to defer their return until a time later than the one originally proposed. At the conclusion of each of the two terms following their reinstatement, students are expected to complete and pass all of the courses in which they remained enrolled. Students who fail to meet this condition are ordinarily required to withdraw after their record has been reviewed by the Committee on Honors and Academic Standing.

A student is eligible to be reinstated only once; a second reinstatement may be considered only under unusual circumstances, ordinarily of a medical nature.

For reinstatement to a fall term, applications must be submitted by 5 p.m. (EST) on June 1. For reinstatement to a spring term, applications must be submitted by 5 p.m. (EST) on November 1. These deadlines are strictly enforced.

Frequently Asked Questions are available online to provide additional information about reinstatement procedures. This site also includes contact information for any reinstatement inquiries, as well as for the Chair of Reinstatement.

FINANCIAL WAIVERS AND REINSTATEMENT

Students on financial aid who have successfully completed the course requirements for reinstatement *in the summer prior to reinstatement* will be forgiven their Student Share for the subsequent summer. Students may apply for a Student Share waiver through Yale's Student Financial Services.

Some students require, upon reinstatement in Yale College, a ninth term of enrollment in order to complete their bachelor's degree. Students who receive financial aid and find themselves in such a situation should consult with a counselor in Student Financial Services about possible Federal financial aid implications.

REINSTATEMENT INTERVIEWS

Interviews with members of the Committee on Reinstatement are required of all applicants for reinstatement. The committee may not approve a student's return to Yale College until after the necessary interviews have taken place. These may include individual in-person meetings for any applicant with the chair of the committee and any other member of the committee, including a member of the Yale Health staff. Interviews are normally conducted prior to the beginning of the term to which the student is seeking reinstatement. While the expectation is that these meetings will take place in person, they may be conducted by video teleconference when circumstances warrant. Contact the chair (jennifer.l.stewart@yale.edu) of the Committee on Reinstatement with questions.

As an integral part of the application for reinstatement, students who withdrew for medical reasons must obtain a recommendation from Yale Health. Such a recommendation must come from either the director of Yale Health or the chief of the Mental Health and Counseling department, or from their official designees within the Health Center; no such recommendation can be made in the absence of

documentation provided to Yale Health that the student has had successful treatment from an appropriate health clinician.

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.

K. Special Arrangements

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 the Yale College Committee on the Year or Term Abroad and admission from an accredited study abroad program.

A term abroad may be taken only during the second term of the sophomore year or either the first or second term of the junior year; students may combine any two of these three terms for a year abroad. By special exception due to COVID-19 travel restrictions, first-term seniors are eligible to study abroad during the fall 2021 or spring 2022 term. Students must enroll in Yale courses for the final term of enrollment. Therefore, students may only enroll abroad as a second-term senior if attending the Yale in London program.* 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 French, German, Italian, Portuguese, Russian, or Spanish are generally expected to take all of their courses in the language of the host country and should have enrolled in the relevant intermediate-level foreign language course (typically a course numbered 140 with an L4 designation) or have demonstrated the equivalent proficiency by examination. Students seeking to study abroad in a country where the primary language is Chinese, Japanese, or Korean should have enrolled in, at minimum, the relevant beginning-level foreign language course (typically a course numbered 120 with an L2 designation) or have demonstrated the equivalent proficiency by examination. Students seeking to study abroad in any other country where the primary language is not English are generally expected to take at least one course studying the language of

the host country. Applicants may petition Yale Study Abroad for an exception to the language eligibility requirements if the program's theme and core courses align with their major.

The credit application for a Year or Term Abroad is available on the Yale Study Abroad website of the Center for International and Professional Experience. 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 application to Student Financial Services. 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.

Applications for study in the fall term of the academic year 2021–2022 or for the full academic year 2021–2022 are due on April 15, 2021. The deadline for applications to study abroad in the spring term of the academic year 2021–2022 are pending. Refer to the Study Abroad website for updates.

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 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 course credits (with the exception of Cambridge or Oxford, for which students earn five credits for attending during Yale's spring term). 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. 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 course work may also continue to be applied toward major and distributional requirements.

- 3. Evidence of course work** 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.
- 4. 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.
- 5. 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 While Away 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 course work should be prepared to provide on their return to Yale copies of all course work and syllabi.
- 6. 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.
- 7. 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, Leave of Absence, Withdrawal, and Reinstatement. 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 two 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.

8. **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 two terms. Students who have accelerated should speak with their residential college dean about the possible need to decelerate. See section Q, Acceleration Policies.
9. **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 Student Financial Services 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.

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 accumulated thirty-six course credits or more, all earned at Yale, in fewer than eight terms of regular enrollment; and (3) students admitted by transfer to Yale College and students whose admission to Yale College was deferred until a spring term. Note that acceleration credits may not yield a completion of degree requirements at the end of a fall term; see section Q, Acceleration Policies. The following rules apply to students of these three kinds.

1. **Notification by the student** By the day on which the student's course schedule is due in the final term of enrollment, the student must notify the Committee on Honors and Academic Standing through the residential college dean that the fall term will be the student's last term of enrollment. Forms on which to make such notification are available in the offices of the college deans. 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 \$100.
2. **Award of degrees and diplomas** Students who complete degree requirements at the end of a fall term are awarded their degrees and their diplomas at Commencement at the conclusion of the spring term of that academic year and are considered to be members of the class that graduates at that Commencement. General Honors and Distinction in the Major are also awarded at that time. 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, however, 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. Such a student would not receive the degree or diploma until the May of the academic year in which degree requirements were completed.

3. **Health coverage** A student whose last term of enrollment is a fall term is eligible, upon application and payment of a fee, for continued coverage by Yale Health during the subsequent spring term, just as if the student were on leave of absence for that term. Such coverage extends to August 31. See section J, Leave of Absence, Withdrawal, and Reinstatement, “Leave of Absence.”

CURRICULAR COMBINATIONS AND COURSE OVERLAP ALLOWANCES

Specific combinations of majors, double majors, multidisciplinary academic programs, 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; one major, one multidisciplinary academic program, and one certificate; two majors and one certificate or one multidisciplinary academic program; a simultaneous Bachelor’s and Master’s Degree (B.A./M.S. or B.A./M.M.) and one certificate or multidisciplinary academic program or 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 multidisciplinary academic program, 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.

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.

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. 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.

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; History; Italian; 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 Director of Academic and Educational Affairs, Joel Silverman (joel.silverman@yale.edu).

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.

Prior to admission to the program, students enrolling in a course that carries both an undergraduate and a graduate number should do so under the graduate number if they wish to apply that course toward the graduate school requirements.

- 2. Application** Students must apply to their department for admission to the program through their director of undergraduate studies no later than the last day of classes in their fifth term of enrollment in Yale College. 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 Director of Academic and Educational Affairs (joel.silverman@yale.edu) 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 courses in the Graduate School. For all students in the program, 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 major during their last four terms at Yale, and must take at least two of those six courses during their last 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 the bachelor's and 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.

- 4. Requirements for the master's degree** To qualify for the master's degree, students must complete eight term course credits in the Graduate School with grades of 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.

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.
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.

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 471 or CGSC 473), 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 course work and submit a syllabus.

Requests for Special Term Courses should be made to the Committee on Honors and Academic Standing, 25 SSS, on forms available from the residential college deans. 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.

LIMIT ON RESIDENTIAL COLLEGE SEMINARS

The number of residential college seminars is limited and the demand for them is great. A student may therefore take no more than four residential college seminars, and no more than two in a single term. Permission to exceed these limits must be secured in advance from the Yale College Committee on Honors and Academic Standing; such permission will be given only if the student can demonstrate that the integrity or coherence of the student's academic objectives would suffer without it.

COURSES IN THE YALE GRADUATE AND PROFESSIONAL SCHOOLS

When a course is open to undergraduate as well as either graduate or professional school students, a Yale College student may enroll under either number, but courses in the graduate and professional schools are not available on the Yale College Credit/D/Fail option; see section B, Grades, "Credit/D/Fail Option."

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 must also complete an additional form downloaded from the University Registrar's Office website. This latter form must be completed by the student, signed by the course instructor, and attached to a copy of the syllabus, and must also be signed by the appropriate agent of the dean or the registrar of the school in which the course is offered.

Requests should be made as early as possible in the term in which enrollment is sought and not later than three weeks after the first day of Yale College classes of the term. 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 will be subject to a fine of at least \$50, with increases of \$5 daily according to lateness.

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.

A student may offer toward the 36-course-credit requirement for the bachelor's degree as many as four course credits earned in professional schools of the University. 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.

COMBINED BACHELOR'S AND MASTER'S DEGREE PROGRAMS IN THE PROFESSIONAL SCHOOLS

Well-qualified students may be able to structure their undergraduate programs so as to become eligible for a master's degree in Public Health, Environmental Management or Environmental Science, or Music after one additional year of graduate study at Yale. For more information see the respective program descriptions in Subjects of Instruction.

COURSES IN YALE SUMMER SESSION

There is no limit on the number of on-campus courses in the Yale Summer Session that a Yale College student may offer toward the requirements for the bachelor's degree; however, no more than four online course credits, including any online credit from outside institutions, may be applied toward a Yale degree. A maximum of two online courses may be taken per summer by Yale College students. Furthermore, any 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.

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 all earned at Yale may count credits earned for a grade in Yale Summer Session toward such acceleration. Work completed under the Credit/D/Fail option cannot yield acceleration credit. See section Q, Acceleration Policies, "Acceleration by the Early Accumulation of Thirty-Six Course Credits All Earned at Yale."

Courses outside a student's major, successfully completed in Yale Summer Session may, with the permission of the student's director of undergraduate studies, be counted toward the requirements of the student's major program. Summer Session courses within the student's major automatically count toward the major. Courses taken for a grade may also be counted toward fulfilling distributional requirements. 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. There are no auditing privileges in Yale Summer Session.

All courses completed 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. 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. For further information about Summer Session courses and transcripts, refer to the Yale Summer Session website.

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 all earned at Yale 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 All Earned at Yale."

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. 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 Academic and Educational Affairs (joel.silverman@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 Academic and Educational Affairs (joel.silverman@yale.edu) is required.

Category 5. Spouses of postdoctoral associates and fellows. In these cases, permission of both the instructor and the Director of Academic and Educational Affairs (joel.silverman@yale.edu) is required.

Category 6. Yale University alumni and their spouses. In these cases, permission of both the instructor and the Director of Academic and Educational Affairs (joel.silverman@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.

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. 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. 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, especially the language requirement.
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 thus granted permission to remain at Yale for an additional term, if the term represents more than the equivalent of eight terms of enrollment at the college level, is not eligible for scholarship assistance from Yale for the additional term, although other forms of financial aid may be available.
5. **Transcripts** A transfer student's Yale transcript indicates the institutions from which the student transferred to Yale and the number of course credits earned there. It does not list the titles of courses taken or 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 K, Special 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. See paragraph 1 above.
8. **Credit/D/Fail** Transfer students have up to four opportunities to convert a course 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.

M. 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 in Yale College. 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.

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 courses 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 courses 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 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. 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, especially 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 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 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 submit their course schedules for approval to their residential college dean according to the course submission 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 in 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** Tuition for the 2021–2020 academic year for Eli Whitney students is \$6,620 per course credit, and Eli Whitney students are not to be charged in excess of the maximum full tuition rate of \$29,975 per term. Yale employees 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.
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 such as career counseling through the Office of Career Strategy and for fellowships through the Center for International and Professional Experience. 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, Leave of Absence, Withdrawal, and Reinstatement. 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 and the number of course credits earned there. It does not list the titles of courses taken or 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 K, Special 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.

N. 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 courses 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 Director of Academic and Educational 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 Director of Academic and Educational Affairs at least one week prior to the Credit/D/Fail conversion deadline. 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 during 2021-2022 is \$6,620 per course credit. 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 course selection period will be refunded the tuition fees paid for that course; (2) a student who drops a course for any reason after the course selection 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 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 he or she is 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.

O. Visiting International Student Program

The Yale Visiting International Student program (Y-VISP) invites selected undergraduate students from Y-VISP partner institutions to pursue full-time study in Yale College during one term or one academic year. Y-VISP students maintain a full course load, live in the residential colleges alongside Yale College students, and are fully integrated members of Yale College's academic, residential, and extracurricular communities. Y-VISP oversight and governance is managed by the program's director and the Y-VISP Steering Committee. Additional information is available on the Yale Visiting International Student 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.

Credits earned on a Year or Term Abroad count as the equivalent of Yale course credits. Courses in Yale Summer Session 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 Arrangements, "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 who wish to receive credit for summer study abroad with outside programs must meet the eligibility requirements and apply for approval through Yale Study Abroad (see paragraph 9, "Non-Yale Summer Abroad," below).

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 Director of Academic and Educational 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 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 number of contact hours for the course must equal or exceed the number of contact hours for an equivalent course offered in Yale College during

the fall or spring term, and the length of term (from the first to the last day of classes) must be at least four consecutive weeks.

2. **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.
3. **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.

4. **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 6, "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.
5. **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).
6. **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., L3 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.

7. **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.
8. **Year or Term Abroad** Yale Study Abroad oversees credit transfer from approved Year or Term Abroad programs. For more information, see section K. Special Arrangements, "Year or Term Abroad."
9. **Non-Yale Summer Abroad** Students who wish to receive credit for summer study abroad with non-Yale programs must apply for approval through Yale Study Abroad. The Non-Yale Summer Abroad credit application deadline for 2021 is April 1, 2021. 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 5, "Distributional requirements," and paragraph 7, "Major requirements," above).
10. **Transfer students** 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 L, Transfer Students, and section K, Special 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.
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, synchronous 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") or for purposes of reinstatement, 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 toward the language requirement (see paragraph 6, "The language requirement and courses taken elsewhere," above).

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 – on which see section L, Transfer Students – 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.

† 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.

Q. Acceleration Policies

ACCELERATION BY THE EARLY ACCUMULATION OF THIRTY-SIX COURSE CREDITS ALL EARNED AT YALE

A student may accelerate progress toward graduation by accumulating thirty-six course credits in fewer than eight terms of enrollment. Such a student must earn all thirty-six course credits at Yale and may not offer course credits earned at another institution in order to reduce the number of terms of enrollment at Yale.

1. **Study abroad** Terms spent on a Year or Term Abroad count as if they were terms of enrollment in Yale College, but course credits earned therein may not be applied to acceleration by the early accumulation of thirty-six course credits because all such credits must be earned at Yale. A spring term at the Yale College program at the Paul Mellon Centre in London is, in fact, a term of enrollment in Yale College, and credits earned in that program may be applied to such acceleration. Attendance at Yale Summer Session or the summer program at the Paul Mellon Centre in London does not count as a term of enrollment, but course credits earned in these summer programs may be applied toward acceleration by the early accumulation of thirty-six credits all earned at Yale. See section K, Special Arrangements, “Courses in Yale Summer Session” and “Yale in London Summer Program.”
2. **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.
3. **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 earned at Yale;

graduation after fewer than six terms of enrollment in Yale College by such an early accumulation of course credits is not permitted.

4. **Notification by the student** A student intending to accelerate through the early accumulation of thirty-six course credits all earned at Yale must notify the Committee on Honors and Academic Standing through the residential college dean of that intention by the day on which the student's course schedule is due in the final term of enrollment. Such notification 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 at the conclusion of that term. Failure to do so will result in the student being charged a fine of \$100.
5. **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, 246 Church Street, 203-432-2330.

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, including required patterns of attendance** 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 as long as the student's sixth and final term of enrollment is a spring term.

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 as long as the student's seventh and final term of enrollment is a spring term.

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. However, the University Registrar's Office will make reasonable efforts to inform students, at the

beginning of the third term of enrollment, of their eligibility to accelerate by one or two terms.

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.
3. **A third term of leave of absence** A student taking an accelerated degree by use of acceleration credits who has had two terms of leave of absence may receive a third 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, Leave of Absence, Withdrawal, and Reinstatement, "Leave of Absence"; a student who has received long-term loans through Yale or who is receiving financial aid from Yale should particularly note "Leave of Absence," paragraph 8.
4. **Withdrawal** If a student withdraws from a term after the date on which course schedules for that term are due, 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 on the recommendation of Yale Health 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.
5. **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 Arrangements, "Courses in Yale Summer Session" and "Yale in London Summer Program."
6. **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 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 Arrangements, “Yale in London Summer Program.”

7. **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 two subsequent terms in Yale College; see section K, Special Arrangements, “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 Center for International and Professional Experience 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 foreign 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 N, Non-degree Students Program.

12. **Transfer students** 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.

III. SUBJECTS OF INSTRUCTION

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 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.)
Judaic 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 and Performance Studies (B.A.)
Urban Studies (B.A.)
Women's, Gender, and Sexuality Studies
(B.A.)

Programs and Certificates in Yale College

MULTIDISCIPLINARY ACADEMIC PROGRAMS

Education Studies

Energy Studies

Global Health Studies

Human Rights Studies

ADVANCED LANGUAGE CERTIFICATES

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)

Italian

Japanese (See under East Asian Languages and Literatures)

Korean (See under East Asian Languages and Literatures)

Latin (See under Classics)

Portuguese

Russian

Spanish

Turkish (See under Near Eastern Languages and Civilizations)

Vietnamese (See under Southeast Asia Studies)

INTERDISCIPLINARY CERTIFICATES

Education Studies

Medieval Studies

SKILLS-BASED CERTIFICATES

Programming (See under Computer Science)

Data Science (See under Statistics & Data Science)

Accounting

Please see Yale Course Search for information about ACCT 270, Foundations of Accounting and Valuation.

Aerospace Studies

Program adviser: George Granholm (george.granholm@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 or send questions to Lt Col Rose Tseng (rose.tseng@yale.edu).

COURSES FOR NONMAJORS

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

ACADEMIC REQUIREMENTS OF THE MAJOR

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.

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 requisite courses: USAF 101, 102, 200, 201, 301, 302, 401, and 402. When the Department of History offers HIST 221, Military History of the West since 1500, cadets may use it to fulfill the one term of the 200-level AFROTC requirement (USAF 202) and also count it toward the bachelor's degree. AFROTC scholarship recipients must also complete either three credits in a language or six credits in any combination of mathematics, physics, chemistry, or engineering. 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

Professor Colonel George Granholm, USAF (*Adjunct*)

Lecturers Major Mitchell Moen, USAF, Lieutenant Colonel Rose Tseng, USAF

African American Studies

Director of undergraduate studies: Aimee Cox (aimee.cox@yale.edu), Rm. 302, 81 Wall St., 432-7758; 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, including 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 K, Special Arrangements, "Two Majors."

The major in African American Studies requires twelve term courses, including seven core courses and five electives in an area of concentration. The seven core courses include the African American history sequence AFAM 160 and AFAM 162, 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 410); the senior colloquium (AFAM 480) and senior essay (AFAM 491).

Area of concentration Students majoring in African American Studies are required to choose an area of concentration 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 will choose an area of concentration 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 concentration 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 concentration, 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 concentration.

Junior seminar In their junior year students must take the junior seminar, AFAM 410. 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 counted toward the major.

SENIOR REQUIREMENT

Senior majors participate in a colloquium in AFAM 480 that gives them an opportunity to exchange ideas with each other and with more advanced scholars. Students in AFAM 480 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 491 under the guidance of a faculty member in the chosen discipline or area of concentration.

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 concentration and schedules for majors must be approved by the DUS.

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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl sen req)

Specific courses required AFAM 160, 162, 410

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

Senior requirement Senior colloquium (AFAM 480) and senior essay (AFAM 491)

FACULTY OF THE DEPARTMENT OF AFRICAN AMERICAN STUDIES

Professors Elijah Anderson, David Blight, Daphne Brooks, Hazel Carby (*Emeritus*), Roderick Ferguson, Phillip Goff, Jacqueline Goldsby, Emily Greenwood, Matthew Jacobson, Gerald Jaynes, Christopher Miller (*Emeritus*), Robert Stepto (*Emeritus*), Michael Veal, Shane Vogel

Associate Professors Aimee Cox, Crystal Feimster, Elizabeth Hinton, Jonathan Howard, Edward Rugemer

Assistant Professors Ernest J. Mitchell, Carolyn Roberts

Lecturers Aaron Carico, Nicholas Forster, Thomas Allen Harris, Elleza Kelley

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 a 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 literatures, 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 401 or an alternative course that either serves to deepen the concentration or provide methodological tools for the senior essay, selected in consultation with the DUS ; (4) a concentration of four term courses, in a discipline such as anthropology, art history, history, languages and literatures, 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 491, 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.

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.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

Students are required to complete a senior essay in AFST 491, 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.

REQUIREMENTS OF THE MAJOR

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 area of concentration

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

Senior requirement Senior essay (AFST 491)

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 Wyrzten (*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 an area of concentration, each student develops a focus for course work 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

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 111–299), including two in cultural history/cultural studies, one broad survey course in American literature, and one course preparatory 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. 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 300–399) 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.

Roadmap See visual roadmap of the requirements.

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 400–490). 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.

Second, the student may complete a one-term senior project or essay (AMST 491). The product should be a thirty-page essay or its equivalent in another medium. To apply for admission to AMST 491, a student should submit a prospectus, signed by the faculty adviser, to the DUS.

Third, the student may enroll in the intensive major (AMST 493 and 494) and work independently for two terms. The intensive major offers an opportunity for significant original research leading to a substantial senior project. AMST 493, 494 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 493 and 494, a student should submit a prospectus, signed by the faculty adviser, to the DUS.

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 K, Special 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.

REQUIREMENTS OF THE MAJOR

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 electives

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

Senior requirement Senior sem (AMST 400–490) or one-term senior project (AMST 491) related to area of concentration

Intensive major Same, except a two-term senior project (AMST 493 and 494) replaces senior sem (AMST 400–490) or AMST 491

FACULTY ASSOCIATED WITH THE PROGRAM OF AMERICAN STUDIES

Professors Ned Blackhawk (*History*), David Blight (*History, African American Studies*), Daphne Brooks (*African American Studies, Theater Studies*), Alicia Schmidt Camacho (*Ethnicity, Race, & Migration*), Hazel Carby (*African American Studies*), Edward Cooke, Jr. (*History of Art*), Michael Denning (*Chair*) (*English, Ethnicity, Race, & Migration*), Wai Chee Dimock (*English*), Kathryn Dudley (*Anthropology*), Roderick Ferguson (*Women's, Gender, & Sexuality Studies*), Joanne Freeman (*History*), Beverly Gage (*History*), Jacqueline Goldsby (*English, African American Studies*), Inderpal Grewal (*Women's, Gender, & Sexuality Studies, Anthropology*), Matthew Jacobson (*African American Studies, History*), Kathryn Lofton (*Religious Studies*), Lisa Lowe (*DGS*), Mary Lui (*History, Head of Timothy Dwight College*), Joanne Meyerowitz (*History*), Charles Musser (*Film & Media Studies*), Tavia Nyong'o (*Theater Studies*), Gary Okihiro (*Theater Studies*), Stephen Pitti (*History, Ethnicity, Race, & Migration, Head of Ezra Stiles College*), Sally Promey (*Divinity School, Religious Studies*), Joanna Radin, (*History of Medicine, Anthropology, History*), Ana Ramos-Zayas (*Ethnicity, Race, & Migration, Women's, Gender & Sexuality Studies*), Marc Robinson (*Theater Studies, English*), Paul Sabin (*History, Environmental Studies*), Caleb Smith (*English*), Robert Stepto (*English, African American Studies*), Harry Stout (*Religious Studies, History*), Michael Veal (*Music, African American Studies*), John Warner (*History of Medicine, History*), Michael Warner (*English*), Laura Wexler (*Women's, Gender, & Sexuality Studies*), Bryan Wolf

Associate Professors Rene Almeling (*Sociology*), Laura Barraclough (*Ethnicity, Race, & Migrations*), Crystal Feimster (*African American Studies*), Zareena Grewal (*Ethnicity, Race, & Migration, Religious Studies*), Daniel HoSang (*Ethnicity, Race, & Migration*), Greta LaFleur (*Women's, Gender, & Sexuality Studies*), Elihu Rubin (*Architecture*), Edward Rugemer (*African American Studies*), Tisa Wenger (*Divinity School, Religion*)

Assistant Professor Albert Laguna (*Ethnicity, Race, & Migration*)

Senior Lecturers James Berger (*DUS*) (*English*), Karin Roffman (*Humanities, English*)

Lecturer Ryan Brasseaux (*Head of Davenport College*)

Anthropology

Director of undergraduate studies: William Honeychurch
(william.honeychurch@yale.edu), Rm. 305, 51 Hillhouse Ave., 432-3676;
anthropology.yale.edu

The major in Anthropology gives a firm grounding in this comparative discipline concerned with human cultural, social, and biological diversity. Anthropology deals not only with that small proportion of humankind in Europe and North America but with societies of the entire world from the remotest past to the present day. It is thus an essential part of a sound liberal education, helping us to see our world from a perspective that challenges ethnocentric assumptions. The major in Anthropology covers the evolution of human and nonhuman primates and the evolutionary biology of living people; world prehistory and the emergence of civilization; diversity and commonality in social organization and culture; the importance of culture for understanding such topics as sickness and health, gender and sexuality, environment and development, media and visual culture, urban life and sport, economic organization and politics, law and society, migration, and religion; and language use as cultural behavior.

The subfields of anthropological inquiry—archaeology, biological anthropology, sociocultural anthropology, and linguistic anthropology—together offer a holistic perspective on humankind and its development.

REQUIREMENTS OF THE MAJOR

Students are required to present twelve course credits toward their major. At least eight term courses must be taught in the Department of Anthropology. These eight must include an introductory or intermediate course (numbered ANTH 001–299) in each of at least three subfields of anthropology; three advanced courses (numbered ANTH 300–470 or 473–490, not including a senior essay seminar); and two electives. Additionally, all students must prepare a senior essay in ANTH 491 or another Anthropology seminar. Majors may take up to three cognate courses in departments other than Anthropology.

Three term courses related to anthropology may be selected from other departments, with approval by the director of undergraduate studies (DUS). Majors are not required to present such cognate courses, but those who do should choose courses that expand their knowledge in one of the subfields of anthropology or in an area of cross-disciplinary concentration. For example, cognate courses for biological anthropology can be found in Ecology and Evolutionary Biology, Earth and Planetary Sciences, Psychology, and Forestry & Environmental Studies; cognates for sociocultural anthropology can be found in Sociology, American Studies, History, Environmental Studies, Religious Studies, Global Affairs, and international and area studies. Appropriate areas of cross-disciplinary concentrations include such topics as area studies (e.g., Africa); anthropological approaches to law, environment, business, the built environment, and health; gender and sexuality studies; evolutionary biology; and geology.

Areas of concentration The major does not have formal tracks, but majors may choose to concentrate in one of the subfields of anthropology. They may also draw on courses

in sociocultural and biological anthropology to pursue a concentration in medical anthropology. Those who concentrate in sociocultural anthropology are strongly encouraged to take a course in ethnographic methods and one in anthropological theory (e.g., ANTH 303 or 311). Those who concentrate in biological anthropology are strongly encouraged to take courses that give them hands-on experience working with material used in the study of human and nonhuman primate anatomy and evolution and that introduce them to laboratory methods.

Credit/D/Fail A maximum of one course taken Credit/D/Fail may be applied toward the Anthropology major.

SENIOR REQUIREMENT

All majors are required to complete a substantial paper during the senior year, either in a seminar or in ANTH 491. There are three options for completing the senior essay. First, students can write a paper for an advanced seminar. A seminar senior essay must be more substantial than a typical term paper and is expected to be 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.

The second option for the senior essay is an independent essay on a subject of the student's choice, completed in ANTH 491. 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. The adviser must have a faculty appointment in Anthropology, and the second reader must have a faculty appointment at Yale.

The third option for the senior essay is a yearlong paper, begun in ANTH 471 or 472 and completed in ANTH 491. 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 471 or 472. Approval is required before the student registers for ANTH 471 or 472, typically in the fall term of the senior year.

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.

Graduate courses Most graduate seminars in anthropology are open to qualified undergraduates. Descriptions are available in the departmental office, 10 Schem St. 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 course credits (incl senior req)

Distribution of courses At least 1 intro survey or intermediate course in each of 3 subfields; 3 advanced courses (not incl senior essay sem; 2 electives; up to 3 cognate courses in other depts or programs with DUS approval)

Substitution permitted 1 study abroad course for 1 ANTH elective

Senior requirement Senior essay in advanced sem; ANTH 491; or a yearlong essay to include ANTH 471 or 472 in addition to ANTH 491

FACULTY OF THE DEPARTMENT OF ANTHROPOLOGY

Professors †Claire Bown, Richard Bribiescas, Richard Burger, †Michael Dove (*Forestry & Environmental Studies*), Kathryn Dudley (*American Studies*), J. Joseph Errington, Eduardo Fernandez-Duque, †Inderpal Grewal (*Women's, Gender & Sexuality Studies*), Marcia Inhorn (*Modern Middle East Studies*), William Kelly, Paul Kockelman, Roderick McIntosh, Catherine Panter-Brick, Eric Sargis, James Scott (*Political Science*), Helen Siu, Kalyanakrishnan Sivaramakrishnan, Anne Underhill (*Chair*), Claudia Valeggia, David Watts

Associate Professors Aimee Cox, Erik Harms, William Honeychurch, Yukiko Koga, Douglas Rogers

Assistant Professors Oswaldo Chinchilla, Louisa Lombard, Lisa Messeri, Jessica Thompson, Serena Tucci

Senior Lecturer †Carol Carpenter

†A joint appointment with primary affiliation in another department or school.

Applied Mathematics

Director of undergraduate studies: John Wettlaufer (john.wettlaufer@yale.edu), Rm. 109 KGL, 432-0892

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; 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 and Materials Science; 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 in satisfying the requirements of the two majors.

Frequently Asked Questions Students are encouraged to consult the Applied Mathematics FAQ for more detail 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 120 or ENAS 151, and MATH 222 or 225 or MATH 226. It may also be satisfied by MATH 230, 231. Computer programming skills are also required and may be acquired by taking ENAS 130, CPSC 100, or 112. 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 194 or MATH 246).
2. A course in probability (S&DS 241 or S&DS 238).
3. A course in data analysis (S&DS 361 or S&DS 230).
4. A course in discrete mathematics (AMTH 244 or CPSC 202).
5. Courses in at least three of the following areas including, but not limited to:
 - (a) optimization: AMTH 437, EENG 400
 - (b) probability and statistics: S&DS 242, 312, 351, 364, 400, 410, 411, 425, ECON 136, APHY 470
 - (c) partial differential equations and analysis: MATH 247, 250, MATH 255, MATH 256, 260, 300, 301, MATH 302, 305, 310, AMTH 428
 - (d) algorithms and numerical methods: CPSC 365, 366, 424, 440, 465, 467, 468, 469, ENAS 440, 441
 - (e) graph theory: AMTH 562, ENAS 962
 - (f) mathematical economics: ECON 125, 126, 350, 351, 417, 433, 460, 471
 - (g) electrical engineering: EENG 397, 436, 455, AMTH 342, S&DS 364
 - (h) data mining and machine learning: S&DS 262, 365, 669, 671, CPSC 445, 453, 470, 474, 477, AMTH 552, 745
 - (i) biological modeling and computation: CPSC 453, 475, 476, BENG 352, 445, 458, ENAS 559
 - (j) physical sciences: ASTR 320, 420, CHEM 333*, EPS 322, 323, 421, 428, 456, PHYS 342, 343, 344, 401, 402, 410, 420, 430, 440, 442, 460, APHY 439, 448
 - (k) engineering: MENG 280, 285, 361, 365, 383, 463, 469, CENG 301, 315
 - (l) linguistics: LING 227, LING 380

*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.

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 encouraged to revisit their program of study each term with the DUS.

6. At least *three advanced courses* in a field of concentration involving the application of mathematics to that field. Programs in science, engineering, computer science,

statistics, and economics are natural sources of concentration. 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 course an additional choice relevant to the Applied Mathematics major such as those listed in point 5 above or for the B.S. 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, must also include:

1. Topics in analysis (MATH 300) or introduction to analysis (MATH 301), Vector analysis (MATH 302), or Analysis 2 (MATH 305); the course selected may not be counted toward the requirements for the major under item 5 above. (MATH 350 and MATH 440 can in specific cases be considered in consultation with the DUS.)
2. An additional course selected from item 5 above.
3. Another course numbered 300 or higher from the list above, or a course numbered 300 or higher in mathematics, applied mathematics, statistics, or quantitative computer science or engineering, subject to the approval of 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 A maximum of one course credit taken Credit/D/Fail may be counted toward the requirements of the major.

SENIOR REQUIREMENT

Both the B.A. and B.S. degree programs require a senior thesis research project (AMTH 491).

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 120 or ENAS 151, and MATH 222 or 225 or 226, or equivalents; ENAS 130, CPSC 100, or 112

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 194 or MATH 246; S&DS 241 or S&DS 238; S&DS 361 or S&DS 230; AMTH 244 or CPSC 202; *B.S.* – same, plus MATH 300, 301, 302, or 305 (in specific cases, MATH 350 and 440, with DUS approval)

Distribution of courses *B.A.* – at least 3 advanced courses in a field of concentration concerning the application of math to that field; 3 addtl courses as specified; *B.S.* – same, with 2 addtl courses as specified

Substitution permitted MATH 230, 231 for mathematics prerequisites

Senior requirement Senior thesis research project (AMTH 491)

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, Ariel Jaffe, Boris Landa, Ofir Lindenbaum

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 on the basis of 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 DUSes 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 151 or MATH 120; and PHYS 301 (or APHY 194 with either MATH 222 or MATH 225 or MATH 226).

The recommended starting courses in physics are PHYS 200 and 201. 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 260 and 261 instead. Students who are less well prepared in physics and mathematics may choose to take PHYS 180 and 181 during their first year, or PHYS 200 and 201 during their sophomore year after they have taken more mathematics courses. One laboratory course, PHYS 166L or 206L, 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 471 and 472. All majors are also required to take APHY 322, 439, and 420, or equivalents. The three remaining advanced courses should focus on a particular area of concentration. For example, a student interested in solid-state and/

or quantum electronics might choose from APHY 321, 448, 449, EENG 320, and 325. A student interested in the physics of materials and/or nanoscience might choose from APHY 448, 449, CHEM 220, and MENG 285. Many other concentrations are possible.

Credit/D/Fail All courses required for the major, beyond the prerequisites, must be taken for a letter grade, with the single exception that one such course may be taken Credit/D/Fail with permission of the DUS. The senior special projects, APHY 471 and 472, may only be taken for a letter grade.

SENIOR REQUIREMENT

Seniors must complete an independent research project, taken as APHY 471 and 472. 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 for 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 151	APHY 322	APHY 472	APHY 448
PHYS 200	APHY 439	EENG 320	APHY 449
PHYS 201	PHYS 301	APHY 420	APHY 471
PHYS 206L			

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 120	PHYS 200	APHY 322	APHY 448
	PHYS 201	APHY 439	APHY 471
	PHYS 206L	EENG 320	APHY 472
	PHYS 301	APHY 420	EENG 406

REQUIREMENTS OF THE MAJOR

Prerequisites PHYS 180, 181, or 200, 201, with appropriate math coreqs and PHYS 166L or 206L; APHY 151 or MATH 120; PHYS 301 (or APHY 194 with either MATH 222 or MATH 225 or MATH 226)

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 concentration, with DUS approval

Specific courses required APHY 322, 439, 420, or equivalents

Substitution permitted Any relevant course approved by DUS

Senior requirement APHY 471 and 472

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, †Marshall Long, †Tso-Ping Ma, Simon Mochrie, †Corey O'Hern, Vidvuds Ozolins, Daniel Prober, Nicholas Read, †Mark Reed, Peter Schiffer, Robert Schoelkopf, †Ramamurti Shankar, †Mitchell Smooke, A. Douglas Stone, †Hongxing Tang, Robert Wheeler (*Emeritus*), Werner Wolf (*Emeritus*)

Associate Professor Peter Rakich

Assistant Professors †Michael Choma, Yu He, Owen Miller, Shruti Puri

†A joint appointment with primary affiliation in another department.

Archaeological Studies

Director of undergraduate studies: Oswaldo Chinchilla
(oswaldo.chinchilla@yale.edu), 51 Hillhouse Ave., Rm. 301,
436-5923, 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 such prehistoric–early historic transformations 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

Council on Archaeological Studies 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 316L; an advanced laboratory course; a theory course; and the senior research project ARCG 491. 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 falling 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.

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

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.

SENIOR REQUIREMENT

The final requirement for the major is a senior research project (ARCG 491) 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior project)

Specific course required ARCG 316L

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 491)

COUNCIL ON ARCHAEOLOGICAL STUDIES

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

Classics Andrew Johnston, Diana Kleiner

Earth and Planetary Sciences Ronald Smith

History Joseph Manning

History of Art Edward Cooke, Jr., Milette Gaifman, Mary Miller

Near Eastern Languages & Civilizations John Darnell, Karen Foster, Eckart Frahm, 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 150, 200, and 280. 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 260, 262, 312, or STCY 176.

PREREQUISITES

Three courses are prerequisite for all concentrations: ARCH 150, 200, and 280.

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 three areas of concentration: Design; History, Theory, and Criticism; or Urbanism. 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; 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 250 and 251 taken during the junior year after the student is accepted into the major; and the history of architecture surveys ARCH 260, and 262 or 312, to be completed by the end of the junior year

2. One elective in history and theory of architecture 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 450 and 494

History, Theory, and Criticism concentration The History, Theory, and Criticism concentration is intended to establish a broad historical and intellectual framework for the study of architecture. An interdisciplinary approach is encouraged through additional courses taken in various fields of humanities and social sciences. Normally these interdisciplinary courses address subjects closely linked to architectural history, theory, and criticism. Such courses may include archaeology, history of religion, 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 written senior essay on a topic approved by the faculty.

For the History, Theory, and Criticism concentration, the following additional courses are required:

1. A core of four courses: the urban laboratory, ARCH 250 or 360 taken during the fall term of junior year; ARCH 362 or an elective taken during the spring term of junior year; and the history of architecture surveys ARCH 260, and 262 or 312 to be completed by the end of junior year
2. Four electives in history and theory of architecture as outlined in the elective options below
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 490 and 491

Urbanism concentration The Urbanism concentration encourages a broad, interdisciplinary investigation of the complex forces that shape the urban physical environment. The sequence of courses culminates in a senior essay that builds on course work, and either develops analysis and planning proposals for a specific site or furthers an individual research agenda.

For the Urbanism concentration, the following additional courses are required:

1. A core of four courses: ARCH 360 and 362 taken during the junior year; and ARCH 341 and 345, to be completed by the end of the junior year
2. Four electives in urbanism and landscape as outlined in the elective options below
3. One elective in history and theory of architecture, materials and design, or structures and computation, as outlined in the elective options below
4. The senior requirement, ARCH 490 and 491

ELECTIVE OPTIONS IN SUBJECT AREAS

History and theory of architecture Electives can be chosen from ARCH 271, 304, 314, 316, 354, 368, 380, 431 or other relevant courses approved by the DUS in History of Art. Examples of approved courses include: HSAR 118, 143, 200, 273, 383, 459, and 485.

Urbanism and landscape Electives can be chosen from ARCH 230, 314, 316, 324, 344, 345, 347, 354, 385, or other relevant courses in American Studies; Ethics, Politics, and Economics; Environmental Studies; or Political Science approved by the DUS. Examples include: AFAM 297, 358, 450, AFST 235, 345, AMST 258, 331, 348, ANTH 414, ENAS 425, ER&M 293, EVST 196, 227, 255, 292, 403, SOCY 341 and 584.

Materials and design Electives can be chosen from ARCH 162, 325, 330 or another relevant course approved by the DUS. One example of an approved course is MENG 285.

Structures and computation Electives can be chosen from ARCH 161, an approved calculus course such as MATH 112, 115, 120, or physics course such as PHYS 180, 201, 280, or other relevant course approved by the DUS. One example of an approved course is MENG 280. (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 advanced technology workshop and materials laboratory. Students enrolled in ARCH 200 are required to complete these sessions at the beginning of the spring term of the sophomore year. Access to digital media equipment will not be 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 200 must take this session at the beginning of the spring term of the sophomore year. Failure to complete the required orientation will preclude completion of the major. Students may not offer substitutions for this orientation. Students should register with the Haas Family Arts Library Public Services Librarian, Lindsay King (lindsay.king@yale.edu), 436-8052. 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 are enrolled in ARCH 200, and who are interested in using the shop, must take these sessions during the first weeks of the spring term of the sophomore year. Access to the woodshop and materials lab will not be 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 counted toward the Architecture major.

SENIOR REQUIREMENT

Seniors in the Design track take ARCH 450 in the fall term and 494 in the spring term. Seniors in the History, Theory, and Criticism track and in the Urbanism track take ARCH 490 in the fall term and 491 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 491 are due in the office of the DUS by early April. Design projects for ARCH 494 are due as specified by the course instructor. All seniors must submit a portfolio of their work to the office of the DUS by late April. For all architecture majors, this portfolio must be representative of the student's design work including prerequisites and the senior project. History, Theory, and Criticism majors 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 150, 200, and 280. The Declaration of Intent to Major 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 must submit an electronic portfolio representative of coursework for ARCH 150, 200, and a paper from ARCH 280. 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 course work and previous performance.

REQUIREMENTS OF THE MAJOR

Prerequisites ARCH 150, 200, and 280

Number of courses 15 course credits (incl prereqs and senior req)

Specific courses required *Design* – ARCH 250, 251; 260; and 262 or 312; *History, Theory, and Criticism* – ARCH 250 or 360; 362 or elective; ARCH 260; and 262 or 312; *Urbanism* – ARCH 360, 362; 341, 345

Distribution of courses *Design* – 1 elective in history and theory of arch, 1 in urbanism and landscape, 1 in materials and design, 1 in structures and computation, all approved by DUS; *History, Theory, and Criticism* – 4 electives in history and theory of arch, 1 elective in urbanism and landscape, or materials and design, or structures and computation; all approved by DUS; *Urbanism* – 4 electives in urbanism and landscape, 1 in history and theory of arch, or materials and design, or structures and computation; all approved by DUS

Other Orientation sessions in advanced technology, library, and shop

Senior requirement *All concentrations* – portfolio representative of design work, including prereqs and senior req; *Design* – ARCH 450 and 494; *History, Theory, and Criticism* and *Urbanism* – ARCH 490 and 491

MEMBERS OF THE SCHOOL OF ARCHITECTURE TEACHING IN YALE COLLEGE

Professors Turner Brooks (*Adjunct*), Keller Easterling, Alexander Garvin (*Adjunct*), 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*), Bimal Mendis (*Adjunct*)

Lecturers Bryan Fuermann, Jerome Haferd, Erleen Hatfield, Justin Moore

Critics Anne Barrett, Marta Justo Caldeira, Katherine Davies, Kyle Dugdale, Andrei Harwell, Gavin Hogben, Adam Hopfner, Joyce Hsiang, George Knight, Timothy Newton, M. Surry Schlabs

Art

(Drawing, Filmmaking, Graphic Design, Painting/Printmaking, Photography, and Sculpture)

Director of undergraduate studies: Lisa Kereszi (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 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. 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 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 instructions on how to apply for limited-enrollment classes. Most studio art courses have a course fee requirement for some provided materials, guest speakers, and other course enrichment; additionally individual course materials must be purchased from a supply list. For courses beginning in the spring term, counseling days and times are still to be determined. All Art majors are required to register with the DUS at the beginning of each term in order to be enrolled or to continue in the major.

PREREQUISITES

The prerequisites for acceptance into the major are a sophomore review, which is an evaluation of work from studio courses taken at the Yale School of Art, and five introductory (courses numbered 001–199) courses. Four of the introductory courses must have been completed at the time of the sophomore review. Visual Thinking (ART 111) and Basic Drawing (ART 114) are mandatory. At the time of the review, the student should be enrolled in the fifth 100-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 001–199 (including Basic Drawing and Visual Thinking); (2) four courses at the 200 level or above; (3) the Junior Seminar (ART 395) or Critical Theory in the Studio (ART 301); (4) the two-term senior project (ART 495 and ART 496); and (5) two courses in the history of art. A student who has completed five courses numbered 001–199 may count a sixth such course towards the 200-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. Generally, required courses for the *graphic design concentration* are: ART 132; 264 or 265; 266 or 370; 368 or 369; and 468 or 469. Students in the *photography concentration* take ART 136 and/or ART 138; 237 and/or 239; 337 or 338; 379; and 401. The *sculpture concentration* requires ART 110; 120 or 121; 345; 346; and ART 445. Required courses for the *filmmaking concentration* include ART 142; 241; 341; 342; and 442 or 443. 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.

Requirements of the *painting/printmaking concentration* for the Class of 2022 With the approval of the DUS, the following changes to the requirements of the *painting/printmaking concentration* may be fulfilled by students who declared their major under previous requirements.

Requirements of the *painting/printmaking concentration* for the Class of 2023 and subsequent classes Specific courses required for this concentration are ART 116; 130; 331 or 332; 224 or 356; and 432, 433 or 457.

Credit/D/Fail Courses taken Credit/D/Fail may be counted toward the requirements of the major.

SENIOR REQUIREMENT

The senior requirement consists of a two-term senior project, ART 495 and ART 496.

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 four course credits for work successfully completed. These credits cannot be used toward the requirements of the Art major; however, they may be counted toward the 36-course-credit graduation requirement.

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.

Facilities fees All Art majors are charged a facilities access and user fee of \$200 per term. Additional course/materials fees are charged in individual courses as specified at the end of each course description in addition to art supplies that need to be purchased. Course/materials fees cannot be refunded after the second week of classes if the student withdraws from a course.

REQUIREMENTS OF THE MAJOR

Prerequisites Favorable faculty review of work done in studio courses before end of sophomore year; ART 111 and 114; 3 addtl courses numbered 001–199

Number of courses 14 courses (incl prereqs and yearlong senior project)

Specific courses required *All concentrations*—ART 395 or 301; *Graphic design*—ART 132; 264 or 265; 266 or 370; 368 or 369; and 468 or 469; *Painting/printmaking*—ART 116, 130; 331 or 332; 224 or 356; and ART 432, 433 or 457; *Photography*—ART 136 and/or 138; 237 and/or 239; 337 or 338; 379, 401; *Sculpture*—ART 110; 120 or 121; 345, 346, 445; *Filmmaking*—ART 142, 241, 341, 342; 442 or 443

Distribution of courses 4 courses at 200 level or above; 2 courses in hist of art

Senior requirement Two-term senior project (ART 495, ART 496)

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

Professors Anoka Faruqee, Samuel Messer (*Adjunct*), Robert Storr

Senior Critics Julian Bittiner, Alice Chung, Johannes DeYoung, John Gambell, Barbara Glauber, Jessica Helfand, Pamela Hovland, Christopher Pullman, Douglass Scott, Henk van Assen

Critics Mark Aronson, Yeju Choi, Benjamin Donaldson, Lisa Kereszi, Sandra Luckow, Richard Rose, Laurel Schwulst, Sarah Stevens-Morling, Scott Stowell, Jonathan Weinberg

Lecturers Jonathan Andrews, Sandra Burns, Brent Howard, Sophy Naess, Ted Partin, Elizabeth Tubergen, Alex Valentine, Anahita Vossoughi, Molly Zuckerman-Hartung

Astronomy

Director of undergraduate studies: Greg Laughlin (astro.dus@yale.edu), 46 Hillhouse, 208, 436-9405; astronomy.yale.edu

Astronomy is a quantitative physical science that applies physics, mathematics, and statistical analysis to observing, describing, and modeling the universe. The undergraduate courses and degree programs offered by the Department of Astronomy train students in research techniques and quantitative reasoning and develop creative problem solvers. Students who complete the major continue on to top-tier graduate programs in astrophysics or related science fields, and they are sought after by employers in a range of fields from health care management to the banking and investment industry. The department offers a B.A. in Astronomy and a B.S. in Astrophysics.

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 150 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 150 to 199 are topical rather than survey courses. Most of these offerings fulfill both the science and the quantitative reasoning requirements. ASTR 155 is a laboratory course that provides a hands-on introduction to astronomical observing. ASTR 160 and 170 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 210 and ASTR 220 focus on fundamental measurements and tools used in astronomy and include an in-depth study of stellar astrophysics (ASTR 210) or galaxies and cosmology (ASTR 220). These courses overlap in content, so students should take either ASTR 210 or 220 but not both. ASTR 255 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 170 and 171, or 180 and 181, or 200 and 201, and MATH 112 and 115.

B.S. degree program Prerequisites for the B.S. degree include an introductory physics sequence (PHYS 180 and 181, or 200 and 201, or 260 and 261); a physics laboratory sequence (PHYS 165L and 166L, or 205L and 206L); and the mathematics sequence MATH 112, 115, and either MATH 120 or ENAS 151. ASTR 155 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 300 and above are more specialized and intensive. The prerequisites for these courses include ASTR 210 or 220, 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 210 or 220, ASTR 255, 310, one additional Astronomy elective numbered 150 or above, and the senior requirement (ASTR 492). Two of the ten courses must be advanced courses in mathematics, such as MATH 120 or ENAS 151, or courses in mathematical methods, including statistics or computer science, such as CPSC 112, MATH 200 or above, or ASTR 356. 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 210 or 220, 255, 310, 320, and a two-term senior project (ASTR 490 and 491). Students also complete three physics courses numbered 400 or above, normally PHYS 401, 402, and 439. In addition, majors choose either one additional 400-level course in physics or an astronomy elective numbered 300 or higher. In mathematics, students complete a course in differential equations selected from MATH 246, PHYS 301, or ENAS 194, and either an additional mathematics course numbered 200 or above or a course in statistics or computing such as CPSC 112, 201, or ASTR 356.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of either degree program.

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 492 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 490 and 491 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.

REQUIREMENTS OF THE MAJOR

ASTRONOMY, B.A.

Prerequisites PHYS 170, 171, or 180, 181, or 200, 201; MATH 112, 115

Number of courses 10 courses beyond prereqs, incl senior req

Specific courses required ASTR 210 or 220; ASTR 255, 310

Distribution of courses 1 astronomy elective numbered 150 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 492)

ASTROPHYSICS, B.S.

Prerequisites PHYS 180, 181, or 200, 201, or 260, 261; PHYS 165L, 166L, or 205L, 206L; MATH 112, 115; MATH 120 or ENAS 151

Number of courses 12 courses beyond prereqs, incl senior req

Specific courses required ASTR 210 or 220; ASTR 255, 310, 320

Distribution of courses 3 courses in physics numbered 400 or above; 1 addtl upper-level course in astronomy or physics; 2 courses in math or mathematical methods, as specified

Substitution permitted ASTR 155 for 1 term of physics lab prereq

Senior requirement Senior independent research project (ASTR 490 and 491)

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*), Gregory Laughlin, Priyamvada Natarajan, †C. Megan Urry, William van Altena (*Emeritus*), Frank van den Bosch, Pieter van Dokkum, Robert Zinn

Associate Professors †Daisuke Nagai, †Nikhil Padmanabhan

Lecturer Michael Faison

†A joint appointment with primary affiliation in another department.

Biology

Program coordinators: Leah Hartmann (amaleah.hartman@yale.edu) and TBA.

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 a Biomedical Engineering (BENG) 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 101–104 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.

Biomedical Engineering

Director of undergraduate studies: James Duncan (james.duncan@yale.edu), N309 D TAC, 785-2427, 313 MEC, 432-9917; 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 artificial organs and new biomaterials. The B.S. degree in Biomedical Engineering is designed to provide students with an understanding of common fundamental methodologies and the ability to develop quantitative approaches to one of four biomedical engineering tracks: Bioimaging, Biomechanics and Mechanobiology, Biomolecular Engineering, and Systems Biology. The flexible 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.

PREREQUISITES

The following prerequisites are common to all tracks in the major: BIOL 101 and 102 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 161 or higher; ENAS 194; MATH 115 (not necessary if placed into MATH 120 or ENAS 151); MATH 120 or ENAS 151; PHYS 180, 181, 205L, and 206L (or 165L and 166L, with DUS permission).

REQUIREMENTS OF THE MAJOR

Students must complete thirteen term courses, totaling at least eleven course credits, beyond the prerequisites, including at least three required courses in the chosen track; two terms of a biomedical engineering laboratory (BENG 355L, 356L); BENG 280, a half-credit course taken sophomore year as part of the senior requirement; and the senior requirement (see below). During the first year, students study basic mathematics, chemistry, and biology. By the end of the sophomore year, students should have taken physics, ENAS 194, BENG 249, and BENG 350. In the junior year, students gain a comprehensive grounding in the field through BENG 351, BENG 352, BENG 353, BENG 355L, and BENG 356L. During the junior and senior years, students acquire depth by taking electives in one of the four areas of concentration. One relevant course (e.g. MB&B 300) may be substituted with DUS permission. A senior seminar and a senior project give students practical, detailed information about their chosen area of concentration.

Students in all tracks are required to take the following courses: BENG 249, 280, 350, 351, 352, 353, 355L, 356L and 480.

Students in the *Bioimaging track* must also take three courses chosen from BENG 404, 406, 410, 444, 445, 475, 476, or 485.

Students in the *Biomechanics and Mechanobiology track* must also take three courses chosen from MENG 185, 280, 361, BENG 404, 406, 410, 434, 453, 455, 456, 457, or 458.

Students in either the *Biomolecular Engineering track* and the *Systems Biology track* must also take three courses chosen from BENG 404, BENG 410, 411, 434, 435, 463, 464, 465, 467, or MENG 361.

Research Courses Students are permitted and encouraged to engage in research before the senior year by enrolling in BENG 471 and/or BENG 472. These courses, offered Pass/Fail, may be taken more than once for credit, but repeated courses do not count toward the major. See Academic Regulations, section C, Course Credits and Course Loads.

Credit/D/Fail No course taken Credit/D/Fail may count toward the major, including prerequisites.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

In their sophomore year, all students must enroll in BENG 280 and in their senior year, all students must enroll in BENG 480; both are half-credit courses. They must also complete a one-term senior project in their final term of enrollment (BENG 474) or a two-term, yearlong project (BENG 473, 474).

ADVISING

Preparation for graduate study The Biomedical Engineering curriculum is excellent preparation for graduate study in engineering, science, and medicine. In some cases, organic chemistry and/or certain biology courses may be substituted for one course in the major after consultation with the DUS.

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 K, Special 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

REQUIREMENTS OF THE MAJOR

Prerequisites BIOL 101 and 102, or higher-level course in MCDB or MB&B with DUS permission; 1 lecture course in chemistry numbered CHEM 161 or higher; ENAS 194; MATH 115 (not necessary if placed into MATH 120 or ENAS 151); MATH 120 or ENAS 151; PHYS 180, 181, and 205L, 206L (or 165L, 166L with DUS permission)

Number of courses 13 term courses, totaling at least 11 course credits, beyond prerequisites (incl senior req)

Specific courses required *All tracks* – BENG 249, 280, 350, 351, 352, 353, 355L, 356L, 480; *Bioimaging track* – 3 from BENG 404, 406, 410, 444, 445, 475, 476, 485; *Biomechanics and Mechanobiology track* – 3 from MENG 185, 361, BENG 404, 406, 410, 434, 453, 455, 456, 457, 458; *Biomolecular Engineering track and Systems Biology track* – 3 from BENG 404, 410, 411, 434, 435, 463, 464, 465, 467, MENG 361

Distribution of courses 2 term courses in life sciences among prerequisites and required courses (typically BIOL 101 and 102 and BENG 350)

Substitution permitted Relevant course with DUS permission

Senior requirement BENG 280, a half-credit course taken sophomore year; BENG 480, a half-credit course taken senior year; a one-term senior project in final term of enrollment (BENG 474) or two-term, yearlong senior project (BENG 473 and 474)

FACULTY OF THE DEPARTMENT OF BIOMEDICAL ENGINEERING

Professors †Helene Beneviste, †Joerg Bewersdorf, Richard Carson, †Nicholas Christakis, †Todd Constable, †Robin de Graaf, James Duncan, Jay Humphrey, Fahmeed Hyder, Themis Kyriakides, †Francis Lee, Andre Levchenko, †Graham Mason, †Evan Morris, †Laura Niklason, †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 †Joerg Bewersdorf, Stuart Campbell, †Daniel Coman, Tarek Famy, Rong Fan, †Gigi Galiana, Anjelica Gonzalez, †Michelle Hampson, †Henry Hsia, Farren Isaacs, †Chi Liu, Kathryn Miller-Jensen, †Dana Peters, †Corey Wilson, †Jiangbing Zhou

Assistant Professors †Nicha Dvornek, †Ansel Hillmer, Michael Mak, Michael Murrell, †Dustin Scheinost, Gregory Tietjen, †Steven Tommasini, †Daniel Wiznia

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)

The Yale in London program offers Yale undergraduates the opportunity to take spring or summer courses in London at the Paul Mellon Centre for Studies in British Art. The program gives students the opportunity to go beyond the traditional classroom into the rich and vibrant environment in British studies, generally including British history and the history of London, where students have the opportunity to look at great works of art in museums and galleries; explore historic palaces and houses; and watch new and legendary actors treading the boards in London.

The spring program consists of four courses, while the summer program has two courses. There are no prerequisites and students from any major and from any year of study may apply. All courses carry full academic credit and must be taken for a letter grade. Courses are taught seminar-style by Yale faculty and leading academics from the UK. Courses bring together British art, architecture, history, literature, theatre, and culture to explore Britain's identity and impact, both local and global, from the Medieval period to today. Classes are held Monday through Thursday so that students can explore London and beyond in the afternoons and on weekends.

Further information on housing, fees, financial aid, and student life is available on the program website. Inquiries may also be directed to yaleinlondon@yale.edu.

The application deadline for the spring term 2022 is Friday, October 15, 2021. Students will be notified of acceptance within one month of the application deadline. Inquiries about the summer program, described under "International Experience" in The Undergraduate Curriculum, should be directed to the same address. Applications for summer 2022 are due Tuesday, February 15, 2022.

Chemical Engineering

Director of undergraduate studies: Michael Loewenberg
(michael.loewenberg@yale.edu), 303 ML, 432-4334; 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 pharmaceuticals.

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 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 112, 115, and ENAS 151 or MATH 120; CHEM 161 and 165 or CHEM 163 and 167; CHEM 134L and 136L; PHYS 180, 181 or PHYS 200, 201 or PHYS 260. 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 twenty courses, totaling nineteen credits, including the senior requirement, CENG 416, and the following courses beyond the prerequisites:

1. Computing: ENAS 130 or CPSC 100 or CPSC 112 or CPSC 200
2. Mathematics: ENAS 194
3. Chemistry: CHEM 174 and 175 or CHEM 220 and 221; CHEM 222L and 223L; CHEM 332 and 333
4. Engineering science: Three term courses chosen from engineering electives
5. Chemical engineering: CENG 150 or CENG 210; 300, 301, 314 (or MENG 361), CENG 315, 411, 412L, 480

B.S. degree program in Engineering Sciences (Chemical) The B.S. degree in Engineering Sciences (Chemical) requires twelve term courses, including the senior requirement, CENG 416 or CENG 490, and the following courses beyond the prerequisites, chosen in consultation with the DUS:

1. Computing: ENAS 130 or CPSC 100 or CPSC 112 or CPSC 200
2. Mathematics: ENAS 194
3. Chemistry: 3 advanced chemistry courses: *option 1*: CHEM 174 and 175 or CHEM 220 and 221; and CHEM 332; or *option 2*: CHEM 174 or 220; CHEM 332 and 333

4. Chemical engineering: CENG 150 or CENG 210; 300, 301, 314 (or MENG 361), CENG 315, 411

SENIOR REQUIREMENT

B.S. degree program in Chemical Engineering In their senior year, students must complete a senior research project in CENG 416.

B.S. degree program in Engineering Sciences (Chemical) In their senior year, students must complete a senior research project in CENG 416 or CENG 490.

REQUIREMENTS OF THE MAJOR

CHEMICAL ENGINEERING, B.S.

Prerequisites MATH 112, 115; ENAS 151 or MATH 120; CHEM 161 and 165 or CHEM 163 and 167; CHEM 134L and 136L; PHYS 180, 181 or PHYS 200, 201 or PHYS 260.

Number of courses 20 courses, totaling 19 credits, beyond prereqs (incl senior req)

Specific courses required ENAS 130, CPSC 100, 112, or 200; ENAS 194; CHEM 174 and 175 or CHEM 220 and 221; CHEM 222L and 223L; CHEM 332, 333; CENG 150 or CENG 210; 300, 301, 314 (or MENG 361), CENG 315, 411, 412L, 480

Distribution of courses 3 addtl electives in engineering

Senior requirement CENG 416

ENGINEERING SCIENCES (CHEMICAL), B.S.

Prerequisites MATH 112, 115; ENAS 151 or MATH 120; CHEM 161 and 165 or CHEM 163 and 167; CHEM 134L and 136L; PHYS 180, 181 or PHYS 200, 201 or PHYS 260.

Number of courses 12 term courses beyond prereqs (incl senior req), chosen in consultation with DUS

Specific courses required ENAS 130, CPSC 100, 112, or 200; ENAS 194; 3 adv chem courses, as specified; CENG 150 or CENG 210; 300, 301, 314 (or MENG 361), CENG 315, 411

Senior requirement CENG 416 or CENG 490

FACULTY OF THE DEPARTMENT OF CHEMICAL AND ENVIRONMENTAL ENGINEERING

Professors Eric Altman, †Paul Anastas, †Michelle Bell, †Ruth Blake, Menachem Elimelech, Gary Haller (*Emeritus*), †Edgar Hertwich, †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

Assistant Professors Drew Gentner, Amir Haji-Akbari, †Shu Hu, Desirée Plata, Mingjiang Zhong

Lecturers †Anikó Bezur, †Paul Whitmore

†A joint appointment with primary affiliation in another department or school.

Chemistry

Director of undergraduate studies: Nilay Hazari (nilay.hazari@yale.edu), 210 KCL, 203-432-0885; 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 100–109.

PREREQUISITES AND INTRODUCTORY COURSES

Prerequisite courses Prerequisites common to all four Chemistry degree programs include two terms of general chemistry and laboratory; single-variable calculus at the level of MATH 115; and one term of introductory physics numbered 170 or higher, or the equivalents in advanced placement. Students also are encouraged to complete a course in multivariable calculus (MATH 120 or ENAS 151).

Introductory courses The majority of students begin with a general chemistry sequence: either CHEM 161 and 165 or CHEM 163 and 167. These courses fulfill the prerequisite for general chemistry in the Chemistry major. Students taking CHEM 161 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 163 will 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. The introductory laboratory sequence is CHEM 134L and 136L; each laboratory course earns 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 174 and 175 are offered expressly for first-year students, other courses in organic chemistry, including CHEM 220 and 221, 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 332 and 333.

PLACEMENT PROCEDURES

Details about placement and preregistration for chemistry courses can be found on the department website. Information about the placement examination and advising also are available on the department website.

Permission keys Enrollment in CHEM 163 or CHEM 174 through the Yale Online Course 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 161, 163, 165, or 167 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 Yale Online Course System, upper-level students should write to chemistry.dus@yale.edu. Those wishing to enroll in CHEM 220 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 Because most advanced courses are offered either in the fall term or have a fall-term course as a prerequisite, students should not plan to complete an isolated spring-term advanced course in any given year without first consulting the director of undergraduate studies (DUS). For the purpose of degree requirements, all DUS-approved undergraduate Chemistry courses numbered 401 or higher typically count as advanced lecture or laboratory courses, as do CHEM 226L, 251L, 331L, 349L, and 335L. Many graduate-level Chemistry courses 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 161 and 165, CHEM 163 and 167, 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

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 two terms of organic chemistry (CHEM 174 or 220, and CHEM 175, 221, or 230) with laboratory (CHEM 222L and 223L), one term of physical chemistry (CHEM 332 or 328), and one term of inorganic chemistry (CHEM 252).

B.A. degree program The B.A. degree program requires eleven term courses, totaling 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 of the advanced courses must be a lecture course in the Chemistry department and at least one must be a Chemistry laboratory course. CHEM 333 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 fourteen term courses, totaling 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 333), one term of physical chemistry laboratory (CHEM 330L), and four additional course credits of advanced chemistry lecture or laboratory courses. At least one of the advanced courses must be a lecture course 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 sixteen term courses, totaling 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 171 or higher, a second term of physical chemistry (CHEM 333), one term of physical chemistry laboratory (CHEM 330L), and five additional course credits of advanced chemistry lecture or laboratory courses. At least two of the advanced courses must be 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 490 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 200 and 201 or PHYS 260 and 261; a term course in physics numbered 400 or higher and approved by the Chemistry DUS may be substituted for the introductory sequence. In addition, eight 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 990. 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 on the final day of classes of the student's eighth

semester to their research adviser. 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 also must 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 490. For more information, see Academic Regulations, section K, Special Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees."

Credit/D/Fail No chemistry courses taken Credit/D/Fail may be counted toward the major (including substitutions for advanced courses).

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

For the B.A. degree program Students in the B.A. degree program must complete the senior seminar CHEM 400, in which they prepare a capstone essay on a chemistry-related topic. The paper 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 490 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 400, in which they prepare a capstone essay on a chemistry-related topic, and complete one additional course credit of advanced chemistry lecture or laboratory courses. One term of CHEM 490 may be counted as the additional advanced course. 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 490.

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 490 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 490.

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 161, 165, 134L, 136L, math prereq	CHEM 220, 221, 252, 222L, 223L, physics prereq	CHEM 332, 333, 330L, 251L, 1 elective	2 terms of CHEM 490, 2 electives

Substitutions for required courses Up to two terms of advanced science courses outside Chemistry may be counted as electives, with the written approval of the DUS. CHEM 490 may not in any circumstance be substituted for any of the laboratory requirements. The graduate courses CHEM 562L, 564L, and 565L 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 421 and two biochemistry electives chosen from MCDB 300, MB&B 300, 301, or selected graduate courses. An inorganic chemistry specialization could include CHEM 450, 452, and 457. A program with emphasis in physical chemistry and chemical physics would have three electives chosen from CHEM 430, 442, 470, or a graduate course in quantum mechanics. Students interested in synthetic organic chemistry complete three electives chosen from CHEM 418, 423, 425, or selected graduate courses. An emphasis in biophysical chemistry includes a course in either chemical biology or biochemistry, as well as two 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.

STUDY ABROAD

In most instances, Chemistry majors find their course of study easier to schedule if they choose to study abroad in 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 Arrangements, "Year or Term Abroad."

UNIQUE TO THE MAJOR

Special restrictions on lecture courses For the general, organic, or physical chemistry sequences, CHEM 161 and 165; CHEM 174 or 220 and CHEM 175, 221, or 230; and CHEM 332 or CHEM 328 and 333, completion of the first term with a passing grade is a prerequisite for registration in the subsequent term. Completion of CHEM 163 with a passing grade is a prerequisite for registration in CHEM 167.

Students receive credit for only one chemistry sequence of any given type. For example, a student who has completed CHEM 161 and 165 may not subsequently

enroll in CHEM 163 or 167; a student who has completed CHEM 174 and 175 may not subsequently enroll in CHEM 220, 221, or 230. 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 Chemistry courses may be taken without the accompanying laboratory, although the department does not recommend it. However, the appropriate lecture course is a prerequisite or corequisite for each laboratory course. This restriction can be waived only by the DUS. Students dropping the lecture course corequisite with a laboratory must also drop the laboratory course.

REQUIREMENTS OF THE MAJOR

Prerequisites CHEM 161 and 165 or CHEM 163 and 167; CHEM 134L and 136L; MATH 115 (MATH 120 or ENAS 151 suggested); PHYS 170, 180, 200, or 260; or equivalents in advanced placement

Number of courses *B.A.* – at least 11 term courses, totaling 10 course credits, beyond prereqs (incl senior req); *B.S.* – at least 14 term courses, totaling 13 course credits, beyond prereqs (incl senior req); *B.S., intensive major* – at least 16 term courses, totaling 15 course credits, beyond prereqs (incl senior req)

Specific courses required *All degrees* – 2 terms of organic chem (CHEM 174 or 220 and CHEM 175, 221, or 230); 2 terms of organic chem lab (CHEM 222L and 223L); 1 term of physical chem (CHEM 332 or 328); 1 term of inorganic chem (CHEM 252); *B.S.* – CHEM 330L, 333; *B.S., intensive major* – CHEM 330L, 333; PHYS 171, 181, 201, or 261

Distribution of courses *B.A. and B.S.* – 4 additional course credits in advanced lectures or labs, including at least 1 lecture and 1 lab; *B.S., intensive major* – 5 additional course credits in advanced lectures or labs, incl at least 2 lectures and 1 lab

Substitution permitted Up to 2 relevant advanced science courses in other departments for advanced chemistry courses with DUS permission

Senior requirement *B.A.* – CHEM 400; *B.S.* – 2 terms of CHEM 490, or CHEM 400 and 1 additional course credit in advanced lecture or lab; *B.S., intensive major* – 2 terms of CHEM 490; all degree programs require submission of senior capstone essay.

FACULTY OF THE DEPARTMENT OF CHEMISTRY

Professors Victor Batista, Gary Brudvig, Robert Crabtree (*Emeritus*), †Craig Crews, R. James Cross, Jr. (*Emeritus*), Jonathan Ellman, John Faller (*Emeritus*), Sharon Hammes-Schiffer, Nilay Hazari, Seth Herzon, Patrick Holland, Mark Johnson, William Jorgensen, J. Patrick Loria, James Mayer, J. Michael McBride (*Emeritus*), Scott Miller, Peter Moore (*Emeritus*), †Anna Pyle, †James Rothman, Martin Saunders, †Dieter Söll, David Spiegel, †Scott Strobel, John Tully (*Emeritus*), Patrick Vaccaro, Kenneth Wiberg (*Emeritus*), Elsa Yan, Frederick Ziegler (*Emeritus*), Kurt Zilm

Associate Professors Jason Crawford, Timothy Newhouse, Sarah Slavoff, Hailiang Wang

Assistant Professors Caitlin Davis, Ziad Ganim, †Stavroula Hatzios, Stacy Malaker, †Mingjiang Zhong

Lecturers Paul Anastas, Paul Cooper, Christine DiMeglio, N. Ganapathi, Jonathan Parr

Preceptors Aaron Clark, Hannah Lant

†A joint appointment with primary affiliation in another department.

Child Study

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 on the Child Study Center website.

Classics

Director of undergraduate studies: Andrew Johnston (andrew.johnston@yale.edu),
204 Phelps Hall

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 001–099 are first-year seminars, with enrollment limited to eighteen. CLCV courses numbered at the 100-level and 200-level are primarily introductory, lecture-style courses, which may or may not include a discussion-section component. CLCV courses numbered at the 300-level are discussion-oriented seminars, with enrollment limited to fifteen.

For courses in Ancient Greek (GREK) and Latin language (LATN), those at the 100-level are introductory and intermediate courses (L1, L2, L3, and L4), while those at the 400-level are advanced seminar-style courses (L5).

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 members of the departmental faculty as soon as possible.

Students who have had the equivalent of two years of college-level instruction may try a 400-level course. It is possible to take GREK 141 or LATN 141 after a 400-level course, or to be admitted to a 400-level course after completion of GREK 131 or LATN 131. First-year students are encouraged to take advantage of the initial course selection period before course schedules are due to find the most appropriate course.

REQUIREMENTS OF THE MAJOR IN CLASSICS

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 art history, and in philosophy are strongly recommended for students enrolled in the Classics major.

The candidate for the Classics major may elect either the standard or the intensive major. In both of these majors the department recognizes two kinds of concentration, one aiming at knowledge of both ancient literatures, the other concentrating on either Greek or Latin literature.

The standard major The standard major in two literatures requires no fewer than ten term courses. These include six language courses in both Greek and Latin at the level of 390 or above, and must include GREK 403 or LATN 390. Also required are one course that covers broadly the literature and/or culture of ancient Greece (CLCV at the 100- or 200-level), one course that covers broadly the literature and/or culture of ancient Rome (CLCV at the 100- or 200-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 majoring in one literature (Greek or Latin) are required to take no fewer than ten term courses. These include six language courses in that literature level of 390 or above, and must include GREK 403 or LATN 390. Also required are one course that covers broadly the literature and/or culture of ancient Greece (CLCV at the 100- or 200-level), one course that covers broadly the literature and/or culture of ancient Rome (CLCV at the 100- or 200-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 (131 and 141) or higher in the second language for two 400-level courses in the major literature.

The intensive major Students who desire a larger measure of independence than the standard major offers may elect the intensive major. In addition to fulfilling the requirements of the standard major (in both literatures, in Greek, or in Latin), students in the intensive major write a senior essay under the regular guidance of a faculty adviser.

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 K, Special Arrangements, "Simultaneous Award of the Bachelor's and Master's Degrees" in the Academic Regulations. Interested students should consult the DUS prior to the sixth term of enrollment for specific requirements in Classics.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

SENIOR REQUIREMENT

For the standard major At the end of the senior year the student majoring in both Greek and Latin takes a comprehensive examination in the history of Greek and Latin literature and culture and in translation of both languages; the student majoring in either Greek or Latin takes a senior departmental examination in the history of the literature of the major and in translation of that literature.

For the intensive major Students may write a one-term essay in either the fall or spring (CLSS 492), or they may write a two-term essay (CLSS 490 and 491) starting in the fall of their senior year. A brief prospectus of the essay must be submitted,

preferably at the end of the junior year and in no case later than the end of September of the senior year. The candidate must submit two copies of the senior essay to the DUS no later than December 6 (CLSS 492) or April 18 (CLSS 490, 491 or 492) of the senior year.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 10 term courses

Specific courses required GREK 403 or LATN 390

Distribution of courses *Two literatures*—6 courses in both langs at level 390 or above, with one of those being GREK 403 or LATN 390; 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 course in ancient hist; 1 addtl course in ancient hist, classical art and archaeology, ancient philosophy, or classical civ; *One literature*—6 courses in lit at level 390 or above, with one of those being GREK 403 for the Greek major and LATN 390 for the Latin major; 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 course in ancient hist related to lit of major; 1 addtl course in ancient hist, classical art and archaeology, ancient philosophy, or classical civ

Substitution permitted *One literature*—2 courses in the other literature numbered 131 or higher for 2 courses in the major literature at 400 level

Senior requirement *Two literatures*—senior dept exam in hist and translation of Greek and Latin lit; *One literature*—senior dept exam in hist and translation of major lit

Intensive major Senior essay (CLSS 490, 491 or CLSS 492) in addition to above

REQUIREMENTS OF THE MAJOR IN CLASSICAL CIVILIZATION

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 essay) 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 131 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 100- or 200-level), and one term course that covers broadly the literature and/or culture of ancient Rome (CLCV at the 100- or 200-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 research and complete an original research project, usually an essay, under the guidance of a faculty adviser. Students choose either a two-term senior project for two course credits (CLCV 450, 451) or a one-term senior project for one course credit (CLCV 452). Students who elect the one-term senior project need to take one additional course towards the major. A brief prospectus of the project must be submitted to the DUS, preferably at the end of the junior year and in no case later than the end of September of the senior year. The completed project must be submitted to the department no later than December 6 (CLCV 452) or April 18 (CLCV 450, 451 or CLCV 452) of the senior year.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl a two-term senior essay, or a one-term senior essay and an additional course)

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 131 or higher; 2 CLCV courses at the 100- or 200-level, 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 Senior project (CLCV 450, 451 or CLCV 452 and an additional course)

REQUIREMENTS OF THE MAJOR IN ANCIENT AND MODERN GREEK

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 standard major The major in Ancient and Modern Greek requires at least ten term courses. These include four term courses at the level of 390 or above in ancient Greek, one of which should be GREK 403; and four term courses, to consist of: one term course that covers broadly the literature and/or culture of ancient Greece (a course with the designation CLCV at the 100- or 200-level), one term course that covers broadly the literature and/or culture of ancient Rome (a course with the designation

CLCV at the 100- or 200-level), one term course in ancient Greek history, and at least one additional term course in the history, art history, 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 must be elected at the intermediate level (MGRK 130, MGRK 140), or above.

The intensive major Students who desire a larger measure of independence than the standard major offers may elect the intensive major. In addition to fulfilling the requirements of the standard major, students in the intensive major write a senior essay under the regular guidance of a faculty adviser.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

SENIOR REQUIREMENT

The standard major At the end of the senior year the student takes a comprehensive examination in the history of Greek literature and culture.

The intensive major Students may write a one-term essay in the fall or spring (CLSS 492), or they may write a two-term essay starting in the fall of their senior year (CLSS 490 and 491). A brief prospectus of the essay must be submitted, preferably at the end of the junior year and in no case later than the end of September of the senior year. The candidate must submit two copies of the senior essay to the DUS no later than December 6 (CLSS 492) or April 18 (CLSS 490, 491, or CLSS 492) of the senior year.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 10 term courses

Specific courses required GREK 403

Distribution of courses 4 term courses in ancient Greek numbered 390 or higher, as indicated; 4 term courses in Greek and Roman history and lit, as indicated; 2 term courses in modern Greek at the intermediate level

Senior requirement Senior dept exam

Intensive major Senior essay (CLSS 490 and 491 or CLSS 492 and an additional course)

CERTIFICATE 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 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 in ancient Greek or Latin beyond the L4 level (four L5 courses; 400-level Greek or 400-level Latin

courses), 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 course, conducted in the target language, such as an independent study course, a graduate seminar, or an advanced seminar may count toward certification requirements.

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.

For additional questions or concerns, please contact the DUS in Classics, Andrew Johnston. (andrew.johnston@yale.edu)

FACULTY OF THE DEPARTMENT OF CLASSICS

Professors Egbert Bakker, Kirk Freudenburg, Milette Gaifman, Emily Greenwood, Verity Harte, Brad Inwood, Diana Kleiner, Christina Kraus, Noel Lenski, Joseph Manning

Associate Professors Andrew Johnston, Pauline LeVen

Assistant Professor Jessica Lamont

Lecturers Susan Matheson, Timothy Robinson, Barbara Shailor, Joseph Solodow

Cognitive Science

Director of undergraduate studies: Joshua Knobe (joshua.knobe@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 110, 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

The requirements of the major for the B.S. and B.A. degrees are the same, except for the skills requirement and the senior requirement. Fourteen 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 201
2. Economics and decision making: ECON 159
3. Linguistics: LING 110, 116, 130, 217, 232, 253
4. Neuroscience: CGSC 201, MCDB 320, PSYC 160, 270
5. Philosophy: PHIL 126, 182, 269, 270, 271
6. Psychology: PSYC 110, PSYC S139E, 140

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 at the intermediate or advanced level; for most disciplines, courses numbered

300 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 prior to the senior year. Courses that fulfill the skills requirement for the B.A. include CPSC 112, 202, LING 224, PSYC 200, and 270. Other courses may fulfill this requirement with permission of the DUS. The skills requirement for the B.S. is fulfilled by PSYC 200 or another course with permission of the DUS.

Junior colloquium In the junior year, students are required to take CGSC 395, a half-credit colloquium in which majors discuss current issues and research in cognitive science and select a senior essay topic.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major, except with permission of the DUS.

SENIOR REQUIREMENT

In the senior year, students take CGSC 491, 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 to discuss current work in cognitive science and their own developing research projects. Students must take this course during their last spring term at Yale. If spring is not the student's final term, (e.g., a planned December graduation date), then it is possible to attend the class and complete some of the assignments, but not turn in the finished thesis until November. In this case, a grade of INC will be given for the Spring term. (Unlike other incomplete grades at Yale, an incomplete for a thesis does not expire.)

B.S. degree program The B.S. degree is typically awarded to students who conduct empirical research as part of their senior requirement. This normally includes designing an experiment and collecting and analyzing data.

B.A. degree program The B.A. degree is typically awarded to students who conduct a nonempirical senior essay. There are no restrictions on the research format for the B.A.

ADVISING AND APPLICATION TO THE MAJOR

Students may apply to enter the major at any point after the first year. Applications must be made in writing to the DUS. 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. Application forms and answers to frequently asked questions are available on the program website.

Roadmap See visual roadmap of the requirements.

REQUIREMENTS OF THE MAJOR

Prerequisite CGSC 110

Number of courses 14 term courses, for a total of 13.5 course credits (incl prereq and senior req)

Specific course required CGSC 395

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.* – empirical research and senior essay in CGSC 491; *B.A.* – nonempirical senior essay in CGSC 491

FACULTY ASSOCIATED WITH THE PROGRAM IN COGNITIVE SCIENCE

Professors Woo-kyoung Ahn (*Psychology*), Stephen Anderson (*Emeritus*), Amy Arnsten (*School of Medicine*), John Bargh (*Psychology*), Paul Bloom (*Psychology*), Hal Blumenfeld (*School of Medicine*), Marvin Chun (*Psychology*), Michael Della Rocca (*Philosophy*), Ravi Dhar (*School of Management*), Julie Dorsey (*Computer Science*), Robert Frank (*Linguistics*), Shane Frederick (*School of Management*), David Gelernter (*Computer Science*), Tamar Gendler (*Philosophy*), Laurence Horn (*Emeritus*) (*Linguistics*), Marcia Johnson (*Emeritus*), Dan Kahan (*Law School*), Frank Keil (*Psychology, Linguistics*), Joshua Knobe (*Philosophy*), Daeyeol Lee (*School of Medicine*), Gregory McCarthy (*Psychology*), Drew McDermott (*Computer Science*), 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*), Fred Volkmar (*School of Medicine*), David Watts (*Anthropology*), Karen Wynn (*Emeritus*) (*Psychology*), Gideon Yaffe (*Law School*), Raffaella Zanuttini (*Linguistics*), Steven Zucker (*Computer Science, Biomedical Engineering*)

Associate Professors Daylian Cain (*School of Management*), Hedy Kober (*School of Medicine*), James McPartland (*Child Study Center*), Maria Piñango (*Linguistics*)

Assistant Professors Ryan Bennett (*Linguistics*), Steve Chang (*Psychology*), Philip Corlett (*Psychiatry*), Molly Crockett (*Psychology*), Yarrow Dunham (*Psychology*), Julian Jara-Ettinger (*Psychology*), George Newman (*School of Management*)

College Seminars

The Residential College Seminar program is designed to enhance the intellectual life of the residential colleges by offering innovative and interdisciplinary courses, for credit, that fall outside typical departmental structures.

The faculty for the seminar program is drawn from many backgrounds, including Yale faculty, both from Yale College and from other schools of the University; faculty from other institutions; and individuals from walks of life outside the university setting. Course descriptions for College Seminars for the fall and spring terms can be found in Yale Course Search. The online listings contain course titles, descriptions, and prerequisites. Course syllabuses are available on Canvas @ Yale.

Students apply to College Seminars before classes begin through an online tool on the program website or through a link in the online course description. Students may apply to a maximum of two College Seminars in a given term; choices are not ranked by order of preference. Students may not ordinarily enroll in more than four College Seminars in their Yale College career. Auditing is not permitted in College Seminars.

Comparative Literature

Directors of undergraduate studies: Moira Fradinger (moira.fradinger@yale.edu), 451 College Street, Rm. 213, 432-8267; registrar: Mary Jane Stevens (maryjane.stevens@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, Near Eastern Languages and Civilizations, Portuguese, Slavic Languages and Literatures, and Spanish.

Prospective majors are strongly encouraged to begin the study of a foreign language 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 (L4/L5) competence in at least one foreign language. Students interested in graduate study in comparative literature should be aware that many programs require reading knowledge of two or three foreign languages.

REQUIREMENTS OF THE MAJOR

The Comparative Literature major requires twelve term courses, including the senior requirement and two required foundational seminars, one of which must be LITR 130. Beyond the two required courses and the senior essay, the major requires nine term courses, with specific requirements for each concentration. All concentrations require students to take courses in at least one foreign literature; all have a period requirement and a theory requirement. Additionally, prospective majors must have an L5 in the foreign language in which they plan to work (in some cases an L4 is acceptable with DUS advisement).

For the period requirement, students must take at least one course in three of five historical periods: 1) Antiquity; 2) Medieval; 3) Early Modern; (4) 17th–18th centuries; and (5) the Modern period (1800–present). Courses taken from other departments (excluding Directed Studies) may fulfill the period requirement with DUS permission.

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.

The Literature and Comparative Cultures concentration

Prospective majors electing the Literature and Comparative Cultures concentration must take two required foundational seminars; LITR 130 and one of LITR 140, 143, or 348. Beyond the two required courses and the senior essay, the concentration requires three courses in a foreign literature (see below), 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 and may include two courses in a related discipline that has 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 elective courses may be in creative writing or Directed Studies.

Foreign literature requirement Majors are required to take at least three literature courses in one foreign language. One of these courses may award the language distributional requirement (L5) in an ancient or modern foreign literature, in which the literature is read in the original language. In some cases, the L5 course with which students entered the major can be counted as one of the three foreign literature courses. Two courses can be taken at a basic literature level (normally equivalent to the third year of language study), but at least one course must be taken at an advanced level (normally equivalent to the fourth year of language study or higher).

The Intensive Language concentration

Prospective majors electing this concentration focus their plan of study on two foreign literatures studied in the original language. They must take two required foundational seminars: LITR 130 and LITR 140; three courses in one foreign literature (one of which may be an L5 course); two courses in a second foreign literature (one of which may be an L5 course); three courses that fulfill the period requirement; and one course that involves a significant element of literary or cultural theory. In all five of the foreign literature courses, the literature must be read in the original language.

The Film concentration

Students in the Film concentration focus their plan of study on film and media. They must take two required foundational seminars: LITR 130 and LITR 143 (or equivalent approved by DUS); three courses that fulfill the period requirement; and they must take two foreign literature courses and one course in film theory. They must choose their three electives from courses in Film and Media Studies.

The 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: LITR 130 and LITR 348 (or equivalent approved by DUS); three courses that fulfill the period requirement; three courses in one foreign literature (one of which can be an L5 course); 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 A maximum of two courses taken Credit/D/Fail may count toward the major, with permission of the DUS. None of the specific required courses may be taken Credit/D/Fail.

SENIOR REQUIREMENT

For the senior essay, 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 in the course descriptions of the senior essay course (LITR 491, 492, 493).

The senior essay may be written over one term (LITR 491) or over two terms (LITR 492, 493). 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 LITR 492 during the fall term and complete their essays in LITR 493 in the spring term. December graduates enroll in LITR 492 in the spring term and complete their essays in LITR 493 during the following fall term. Students planning to begin their essay in the spring term should notify the DUS by the last day of classes in the fall term.

COURSE SUBSTITUTIONS

A literature course taught in English translation is sometimes suitable as a foreign 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 registrar or the DUS can provide this form; students should submit it to the DUS 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 114, 115, 120, 121, or 450 may take a total of three English literature courses to fulfill the three foreign literature course requirement, or they may fulfill the major requirements by taking three courses 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 literature requirement.

COURSES WITH ADVANCED LITERATURE INSTRUCTION

The following table lists languages in which advanced literature instruction is available at Yale, specifying courses that fulfill the basic and advanced literature requirements for the majors. Courses with numbers higher than those listed also normally fulfill the requirement, providing that they focus on literature (rather than language) and that the literature is read in the original language.

Other ancient and modern languages, including those from Africa, South Asia, and the Middle East, may be suitable for either major if a qualified faculty adviser is available to supervise the student.

Language	Basic Literature Course	Advanced Literature Course
Arabic	ARBC 150, 151	ARBC 161 or 165
Chinese	CHNS 150, 151	CHNS 170 or 171
French	FREN 170	Courses in French numbered 200 or higher
German	Courses in German numbered 170 or higher	Courses in German numbered 200 or higher
Ancient Greek	GREK 131 or 141	Ancient Greek courses numbered 400 or higher
Modern Hebrew	By arrangement with instructor	By arrangement with instructor
Italian	ITAL 162 and 172	Courses in Italian numbered 200 or higher
Japanese	JAPN 150, 151	JAPN 170 or 171
Korean	KREN 150, 151	EALL 470 or 471
Latin	LATN 131 or 141	Latin courses numbered 400 or higher
Persian	PERS 150	PERS 150
Portuguese	By arrangement with instructor	By arrangement with instructor
Russian	RUSS 150, 151	Courses in Russian numbered 170 or higher
Spanish	SPAN 261, 262, 266, or 267	Courses in Spanish numbered 300 or higher

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific courses required *All concentrations*—LITR 130; *Literature and Comparative Cultures*—1 of LITR 140, 143, or 348; *Intensive Language*—LITR 140; *Film*—LITR 143; *Literary Translation*—LITR 348 or equivalent

Distribution of courses *All concentrations*—3 period courses, as specified; *Literature and Comparative Cultures*—3 courses in a foreign lit, as specified, 1 course in literary or cultural theory, 2 elective courses; *Intensive Language*—3 courses in one foreign lit, 2 courses in a second foreign lit, 1 course in literary or cultural theory; *Film*—2 foreign lit courses, 1 course in film theory; 3 electives in Film and Media Studies; *Literary Translation*—3 courses in a foreign lit, as specified, 1 course in literary or cultural theory, 2 courses in translation studies

Senior requirement One-term senior essay (LITR 491); or two-term senior essay (LITR 492 and LITR 493)

FACULTY OF THE DEPARTMENT OF COMPARATIVE LITERATURE

Professors Dudley Andrew, Peter Brooks (*Emeritus*), Rüdiger Campe, Katerina Clark, Roberto González Echevarría, Martin Hägglund, Hannan Hever, Carol Jacobs (*Emeritus*), Pericles Lewis, Rainer Nägele (*Emeritus*), David Quint, Katie Trumpener, Jing Tsu, Jane Tylus, Jesús Velasco

Associate Professors Robyn Creswell, Marta Figlerowicz, Moira Fradinger, Ayesha Ramachandran

Assistant Professor Samuel Hodgkin

Senior Lecturer Peter Cole

Lecturers Jan Hagens, Candace Skorupa, George Syrimis

Affiliated Faculty Rolena Adorno (*Spanish & Portuguese*), R. Howard Bloch (*French*), Francesco Casetti (*Film & Media Studies*), Kang-i Sun Chang (*East Asian Languages & Literatures*), Michael Denning (*American Studies*), Alice Kaplan (*French*), Tina Lu (*East Asian Languages & Literatures*), John MacKay (*Slavic Languages & Literatures*), Giuseppe Mazzotta (*Italian*), Christopher L. Miller (*French*), Joseph Roach (*English*), Maurice Samuels (*French*), Ruth Yeazell (*English*)

Computer Science

Director of undergraduate studies: James Aspnes (james.aspnes@yale.edu), AKW 401, 432-1232; cpsc.yale.edu

The Department of Computer Science offers both B.S. and B.A. degree programs, as well as four combined majors in cooperation with other departments: Electrical Engineering and Computer Science, Computer Science and Economics, Computer Science and Mathematics, and Computer Science and Psychology. Each major program not only provides a solid technical education but also allows students either to take a broad range of courses in other disciplines or to complete the requirements of a second major.

The Computer Science and combined major programs share a common core of five computer science courses. The first is CPSC 201, 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, data structures, systems programming and computer architecture, and algorithm analysis and design. Together these courses include the material that every major should know.

The core courses are supplemented by electives (and, for the combined majors, 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, through which students experience the challenges and rewards of original research under the guidance of a faculty mentor.

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 200 and CPSC 201, none assumes previous knowledge of computers.

1. CPSC 100, taught jointly with Harvard University, teaches students majoring in any subject area how to program a computer and solve problems. No prior experience is required.
2. CPSC 112 teaches students majoring in any subject area how to program a computer and solve problems using the language Java. Students with previous programming experience should consider taking CPSC 201 instead.
3. CPSC 134 provides an introduction to computer music, including musical representations for computing, automated music analysis and composition, interactive systems, and virtual instrument design.
4. CPSC 150 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 151 studies the history of the graphical user interface in an attempt to guess its future. This course also satisfies the writing distributional requirement.

6. CPSC 183 explores the myriad ways that law and technology intersect, with a special focus on the role of cyberspace. This course satisfies the social science distributional requirement.
7. CPSC 200, intended as a survey course for nonmajors, focuses on practical applications of computing technology while examining topics including computer hardware, computer software, and related issues such as security and software engineering.
8. CPSC 201 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 201 without taking CPSC 112. (These courses meet at the same time so that students are easily able to change levels if necessary.)
9. CPSC 202 presents the formal methods of reasoning and the concepts of discrete mathematics and linear algebra used in computer science and related disciplines.

REQUIREMENTS OF THE MAJOR

The B.S. and the B.A. degree programs have the same required five core courses: CPSC 201; CPSC 202 or MATH 244; CPSC 223; CPSC 323; and CPSC 365 or 366. CPSC 280 and 490 may not be counted toward these core courses.

B.S. degree program The B.S. degree program requires a total of twelve term courses, the 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 K, Special 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 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 690, 691, or 692. 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 Courses taken Credit/D/Fail may not be counted toward the major. All courses in the major must be taken for a letter grade.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

In the senior year students must take CPSC 490, an independent project course in which students select an adviser to guide them in research in a subfield of computer science. With permission of the DUS, students may enroll in 490 more than once or before their senior year.

ADVISING

All Computer Science majors in the sophomore, junior, and senior years should have their programs approved by the DUS. Students majoring in Computer Science are advised to complete CPSC 201 and 223 by the end of the sophomore year.

Electives 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 considering graduate study in computer science are advised to take CPSC 421 and 422, as well as courses covering the breadth of computer science, including programming languages and systems, artificial intelligence, scientific computing, and theoretical computer science.

Students interested in using computers to solve scientific and engineering problems are advised to take CPSC 440 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 202. 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 222 or 225, MATH 226, and MATH 120.

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 201	CPSC 202 and CPSC 323	Two electives	CPSC 490
CPSC 223	CPSC 365 or 366 One elective	Two electives	One elective
	Sophomore	Junior	Senior
	CPSC 223	CPSC 365 or 366	Two electives
	CPSC 201	CPSC 323	CPSC 490
	CPSC 202	Two electives	Two electives

REQUIREMENTS OF THE MAJOR

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 201; CPSC 202 or MATH 244; CPSC 223; CPSC 323; and CPSC 365 or 366

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 490)

CERTIFICATE IN PROGRAMMING

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 100 or 112, or successful completion of an AP Computer Science course.

REQUIREMENTS OF THE CERTIFICATE

Students may not use any of the five required courses, indicated below, to satisfy the requirements of any major, multidisciplinary academic program (MAP), 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 taken Credit/D/Fail may be used to satisfy any of the requirements; no course may be used to satisfy more than one of them.

Programming One from CPSC 201 or CPSC 200

Data structures CPSC 223

Advanced programming One from CPSC 327 or CPSC 323

A programming elective A CPSC course with CPSC 223 as a listed or implied prerequisite and a primary focus on programming (such as CPSC 424, 437, 439, 446, or 478) 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 334, 335, 376, 431, 432, 474, 477, or LING 380) or a course in algorithms (such as CPSC 365 or 366)

ADVISING

A faculty member from the Department of Computer Science will be available to advise students pursuing the Certificate. Exceptions to the above requirements, other than the substitution of a more advanced course for a required one, are limited. Refer to the Computer Science website for a list.

REQUIREMENTS

Prerequisite CPSC 100 or 112, or AP Computer Science course

Number of courses 5 term courses

Specific course required CPSC 201 or 200; CPSC 223; CPSC 327 or 323

Distribution of courses 2 additional courses as specified

FACULTY OF THE DEPARTMENT OF COMPUTER SCIENCE

Professors Dana Angluin, James Aspnes (*DUS*), Dirk Bergemann,* Ronald Coifman,* Aaron Dollar,* Julie Dorsey, Joan Feigenbaum, Michael Fischer, David Gelernter, Mark Gerstein,* John Lafferty,* Rajit Manohar,* Drew McDermott (*Emeritus*), Dragomir Radev, Vladimir Rokhlin,† Holly Rushmeier, Brian Scassellati, Martin Schultz (*Emeritus*), Zhong Shao (*Chair*), Avi Silberschatz, Daniel Spielman, Leandros Tassioulas,* Nisheeth Vishnoi, Y. Richard Yang, Lin Zhong, Steven Zucker†

Associate Professors Abhishek Bhattacharjee, Theodore Kim, Smita Krishnaswamy,* Sahand Negahban,* Ruzica Piskac, Phillip Strack

Assistant Professors Yang Cai, Wenjun Hu,* Julian Jara-Ettinger,* Amin Karbasi,* Anurag Khandelwal, Charalampos Papamantou, Robert Soulé, Jakub Szefer,* David Van Dijk,* Marynel Vázquez, Andre Wibisono

Senior Research Scientists Robert Bjornson, Andrew Sherman

Senior Lecturers James Glenn, Kyle Jensen,* Stephen Slade

Lecturers Timothy Barron, Andrew Bridy,† Rob Brunstad, Cody Murphey, Scott Petersen, Brad Rosen, Andrew Sherman, Cecilia Xie

*A secondary appointment with primary affiliation in another department or school.

†A joint appointment with primary affiliation in another department or school.

Computer Science and Economics

Director of undergraduate studies: Philipp Strack (philipp.strack@yale.edu)
(Economics), Rm. 27, 30 HLH

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.

PREREQUISITES

Prerequisite to this major is basic understanding of computer programming, 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 programming prerequisite may be satisfied with CPSC 100 or CPSC 112; the discrete mathematics prerequisite may be satisfied with CPSC 202 or MATH 244; the calculus prerequisite may be satisfied with MATH 112; the microeconomics prerequisite may be satisfied with ECON 110 or ECON 115; and the macroeconomics prerequisite may be satisfied with ECON 111 or ECON 116. 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

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 201; CPSC 223; CPSC 323; CPSC 365 or 366; ECON 121 or 125; two courses in econometrics (ECON 117 and 123 or ECON 135 and 136); ECON 351; one course in the intersection of computer science and economics (e.g., CPSC 455, ECON 417, ECON 433 or CPSC 474). With permission of the DUS, S&DS 241 and S&DS 242 may be taken instead of ECON 135.

Elective courses are essentially those courses that count as electives in the Computer Science major, the Economics major, or both. Exceptions are courses such as CPSC 455, ECON 417, ECON 433 in the intersection of computer science and economics that count as electives in CSEC or both. At least one such course is required for CSEC, and students may not count the same course as an elective for CSEC. ECON 122 and S&DS 365 can count as an elective, ECON 159 cannot count as an elective. 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.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the major.

SENIOR REQUIREMENT

In the senior year, each student must complete CSEC 491, 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.

REQUIREMENTS OF THE MAJOR

Prerequisites basic knowledge of programming, discrete math, calculus, microeconomics, and macroeconomics as determined by DUS and academic advisers, as indicated

Number of courses 14 term courses (not incl prereqs or senior req)

Specific courses required CPSC 201, 223, and 323; CPSC 365 or 366; ECON 121 or 125; ECON 117 and 123 or ECON 135 and 136; ECON 351

Distribution of courses 1 course in intersection of CPSC and ECON, as specified; 5 electives as specified

Substitution permitted S&DS 241 and 242 may substitute for ECON 135 with DUS permission; a more advanced course in the same area may substitute for a required course with DUS and academic adviser permission

Senior requirement CSEC 491

Computer Science and Mathematics

Directors of undergraduate studies: James Aspnes (james.aspnes@yale.edu) (Computer Science), 401 AKW, 432-1232; Andrew Neitzke (Mathematics) DL 425; associate director of undergraduate studies: Miki Havlickova (miki.havlickova@yale.edu) (Mathematics), DL 446

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

The major requires fourteen term courses as well as a senior project. Six of the fourteen courses must be in computer science: CPSC 201, 223, 323, and 365 or 366; one advanced course with significant mathematical content; and one additional advanced course other than CPSC 490. The remaining eight courses must be in mathematics: MATH 120, either 222 or 225 or 226, 244, and five additional term courses numbered above MATH 200 other than MATH 470.

Students who completed multivariable calculus during high school may consult the DUSes about replacing MATH 120 with a higher level mathematics course. MATH 230 and 231 may replace (but do not count in addition to) MATH 120 and MATH 222 or 225 or 226.

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.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the major.

SENIOR REQUIREMENT

The senior requirement is a project or an essay on a topic acceptable to both departments. Students typically enroll in CPSC 490 or MATH 475. An oral report on the mathematical aspects of the project must be presented to the Mathematics faculty. 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 14 term courses, 6 in computer science and 8 in math (not incl senior req)

Specific courses required CPSC 201; 223, 323; 365 or 366; MATH 120; 222 or 225 or MATH 226; 244

Distribution of courses 2 addtl courses in computer science, 1 adv course with significant mathematical content and one 1 adv course other than CPSC 490; 5 addtl courses in math numbered above 200 (may not be MATH 470)

Substitution permitted: MATH 230 and MATH 231 for MATH 120 and MATH 222 or 225 or 226

Senior requirement Senior project or senior essay on topic acceptable to Comp Sci and Math depts with written approval from both DUSes; oral report to Math dept on mathematical aspects of project

Computer Science and Psychology

Directors of undergraduate studies: James Aspnes (james.aspnes@yale.edu) (Computer Science), 401 AKW, 432-1232; Jutta Joormann (jutta.joormann@yale.edu) (Psychology), 205 K, 432-0699

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 110, 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

Eight of the fourteen required courses must be in computer science: CPSC 201, 202, 223, 323, and 365 or 366, and three advanced computer science courses in artificial intelligence (examples of such courses are those in the range CPSC 470–CSPC 477). MATH 244 may substitute for CPSC 202. CPSC 280 and 490 may not be counted as one of these courses.

The remaining six courses must be in psychology, including PSYC 200; at least one from PSYC 210–299; 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 (DUSes), 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. An additional course in psychology and an examination arranged with the instructor of PSYC 200 may substitute for PSYC 200.

Credit/D/Fail No course in computer science taken Credit/D/Fail may be counted toward the major; no more than one course in psychology taken Credit/D/Fail may be counted toward the major. No 200-level course in psychology taken Credit/D/Fail may be counted.

SENIOR REQUIREMENT

Students must take either CPSC 490 or PSYC 499, 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.

REQUIREMENTS OF THE MAJOR

Prerequisite PSYC 110

Number of courses 14 term courses beyond prereq (not incl senior project)

Specific courses required CPSC 201, 202, 223, 323, and 365 or 366; PSYC 200

Distribution of courses 8 courses in CPSC, with 3 advanced AI courses; 6 courses in PSYC, incl PSYC 200; at least 1 additional course from PSYC 210–299; 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 DUSes, and as specified: MATH 244 for CPSC 202; 1 relevant course in cognitive psychology or cognitive science for 1 course in AI; 1 addtl course in PSYC and exam arranged with instructor for PSYC 200

Senior requirement CPSC 490 or PSYC 499, with project approved by DUS in each dept

Computing and the Arts

Director of undergraduate studies: Julie Dorsey (julie.dorsey@yale.edu), 508 Watson Hall, 51 Prospect St., 432-4249

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 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 either CPSC 100 or CPSC 112, which should be taken during the first year. There are two additional prerequisites for the Art track, ART 111 and 114. There are no additional prerequisites for the Architecture track, the History of Art track, the Music track, or the Theater and Performance Studies track. There is no required favorable review of studio work for admission to the major in any track.

REQUIREMENTS OF THE MAJOR

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 201, 202, and 223. Students are advised to complete CPSC 202 and 223 by the end of the sophomore year. MATH 244 may be substituted for CPSC 202. The six remaining courses are selected from one of the arts disciplines. Students choose a track in architecture, art, history of art, music, or theater and performance studies. All requirements for a single track must be satisfied, as specified below.

The Architecture track requires the following courses in addition to the Computer Science courses listed above: (1) ARCH 150 and 200; (2) two courses from ARCH 260, 312, 360, and 362; (3) two elective courses from any of the three concentrations: Design; History, Theory, and Criticism; Urbanism; (4) two courses from CPSC 437, 446, 475, 478, 479, or 484; and (5) one additional intermediate or advanced CPSC course (excluding CPSC 490).

The Art track 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 100-level courses beyond ART 111 and 114, such as ART 132 or 184; (2) two courses in Art at the 200 or 300 level, such as ART 285 or ART 369; (3) ART 395 or ART 301; (4)

one course in Art at the 400 level, such as ART 495; (5) two courses selected from CPSC 437, 446, 475, 478, 479, or 484; (6) one additional intermediate or advanced Computer Science course (excluding CPSC 490). Seniors following the art track are charged a \$200 facility access fee each semester and will have access to a shared studio and many facilities in the School of Art.

The History of Art track requires the following courses in addition to the Computer Science courses listed above: (1) one introductory, 100-level, History of Art course; (2) two History of Art courses at the 200, 300, or 400 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 401; (5) one 400-level seminar in History of Art; (6) two courses selected from CPSC 437, 475, 478, or 479, one of which must be CPSC 478 or 479; (7) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

The Music track requires the following courses in addition to the Computer Science courses listed above: (1) MUSI 315; (2) five term courses chosen from MUSI 231, MUSI S290, 320, 321, 409, 414, 415, 420, 421, 425, 481, 495; (3) CPSC 431; (4) CPSC 432; (5) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

The Theater and Performance Studies track requires the following courses in addition to the Computer Science courses listed above: (1) THST 110; (2) THST 111; (3) two courses in the Artistic Practice domain; (4) two courses in the Histories domain; (5) two courses in the Performance Theory domain; (6) CPSC 431 or 432; (7) CPSC 478, 479, or 484; (8) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the major.

SENIOR REQUIREMENT

The senior project requires two terms: one term of CPAR 491, and one term of ARCH 491, ART 496, HSAR 499, one from MUSI 496–499, or THST 471 or 491, depending on the track 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.

REQUIREMENTS OF THE MAJOR

Prerequisites *All tracks*—CPSC 100 or CPSC 112; *Art track*—ART 111, 114, and sophomore review

Number of courses 12 term courses beyond prereqs (not incl senior project)

Specific courses required *All tracks*—CPSC 201, 202, 223; *Architecture track*—ARCH 150, 200; 2 courses from ARCH 260, 312, 360, 362; 2 courses from CPSC 437, 446, 475, 478, 479, or 484; *Art track*—ART 395 or 301; *History of Art track*—2 from CPSC 437, 475, 478, 479, including 1 of CPSC 478, 479; HSAR 401;

Music track – CPSC 431, 432; MUSI 315; *Theater and Performance Studies track* – THST 110, THST 111, CPSC 431 or 432; CPSC 478, 479, or 484

Distribution of courses *All tracks* – 3 addtl courses in Comp Sci, incl 1 intermediate or advanced course beyond specific reqs (excluding CPSC 490); *Architecture track* – 2 courses from the concentrations: Design; History, Theory, and Criticism; and Urbanism; *Art track* – 2 courses in Art at 100 level (excluding prereqs), 2 courses at 200 or 300 level, and 1 at 400 level as specified; 2 CPSC courses at specified; *History of Art track* – 1 intro, 100-level course; 2 courses in different areas of History of Art at 200, 300, or 400 level; 1 sem at 400-level in History of Art; 1 studio art course; *Music track* – 5 courses from MUSI 231, MUSI S290, MUSI 320, 321, 409, 414, 415, 420, 421, 425, 481, 495; *Theater and Performance Studies track* – 2 courses in each of the three domains as specified

Substitution permitted MATH 244 for CPSC 202

Senior requirement *All tracks* – Two-term senior project including CPAR 491, approved by DUS; *Architecture track* – ARCH 491; *Art track* – ART 496; *History of Art track* – HSAR 499; *Music track* – one from MUSI 496–499; *Theater and Performance Studies track* – THST 471 or 491

DeVane Lecture Course

The next DeVane Lecture Course is pending.

Directed Studies

Director of undergraduate studies: Katja Lindskog (katja.lindskog@yale.edu), HQ (320 York St.); Chair of Humanities: Bryan Garsten (bryan.garsten@yale.edu), Whitney Humanities Center 212 432-1313; directedstudies.yale.edu

Directed Studies (DS), a selective program for first-year students, is a seminar-based interdisciplinary introduction to influential texts that have shaped many Western traditions and cultures. Spanning works from ancient Greece to the late twentieth century, 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 colloquia 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

Director of undergraduate studies: Mary-Louise Timmermans (mary-louise.timmermans@yale.edu), 111 KGL, 432-3167; 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 also select a specific track to focus their work on planetary or environmental phenomena of particular interest. The four B.S. tracks 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. track, 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 track, see Requirements of the Major.

REQUIREMENTS OF THE MAJOR

B.S. degree program Majors in the B.S. program in Earth and Planetary Sciences choose from four tracks: Atmosphere, Ocean, and Climate; Environmental and Energy Geoscience; Paleontology and Geobiology; and Solid Earth Science. The tracks are suggested pathways to professional careers and major areas of research in earth and planetary sciences. Students may change tracks during their course of study with guidance from the DUS.

1. The Atmosphere, Ocean, and Climate track 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 165 or CHEM 167; PHYS 180, 181 and PHYS 205L, 206L; ENAS 130 or equivalent; and mathematics through differential equations (MATH 120 or ENAS 151, and ENAS 194). The major requirements consist of at least eleven term courses, for 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, with any accompanying laboratory, selected from EPS 100, 101, 110, and 111L, or EPS 125 and 126L. Five core courses, totaling five course credits, introduce students to Earth's climate system (EPS 140), meteorology (EPS 322), physical oceanography (EPS 335), fluid mechanics (MENG 361), and statistics or linear algebra (S&DS 230 or 238 or MATH 222). 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 track 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 165 or CHEM 167 and mathematics through multivariate calculus (MATH 120 or ENAS 151). Depending on their area of focus, students may choose a prerequisite in physics (PHYS 170, 171; or PHYS 180, 181; or PHYS 200, 201), or they may choose cellular biology (BIOL 101 and 102, or MCDB 120) and evolutionary biology (BIOL 103 and 104, or E&EB 122, or EPS 125 and 126L). The major requirements consist of at least eleven term courses, for 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, with any accompanying laboratories, selected from EPS 100, 101, 110, and 111L, EPS 125 and 126L, or EPS 140. Four core courses are chosen from topics in general resource use and sustainability (EPS 205), Earth's surface processes (EPS 232), the microbiology of surface and near-surface environments (EPS 255), fossil fuels and energy transitions (EPS 274), renewable energies (EPS 275), geochemical principles (EPS 301), structural geology (EPS 312), meteorology (EPS 322), and satellite-based image analysis (EPS 362). 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 track 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 101-104, or MCDB 120 and E&EB 122), CHEM 165 or CHEM 167, and mathematics through multivariate calculus (MATH 120 or ENAS 151). The major requirements

consist of at least thirteen term courses, for twelve course credits, beyond the prerequisites, including either the senior essay or the senior thesis. Students take one of EPS 100, 101, 110, and 111L, to gain geological and environmental context, and they are introduced to the fossil record and evolution in EPS 125 and 126L. Four core courses give majors a comprehensive background in sedimentary rocks and rock correlation (EPS 232 or equivalent), the study of evolution (E&EB 225 or equivalent), microbiology in past and present environments (EPS 255 or equivalent), Earth's carbon cycle and climate (EPS 310, 402, or equivalent), and statistical data analysis as applied to the life sciences (S&DS 101 or equivalent). 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 one elective must be from EPS.

4. The Solid Earth Science track 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 time scales. The prerequisites are CHEM 165 or CHEM 167, physics (PHYS 170, 171; or PHYS 180, 181; or PHYS 200, 201), and mathematics through multivariate calculus (MATH 120 or ENAS 151). The major requirements consist of at least eleven courses, for 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, with any accompanying laboratories, selected from EPS 100, 101, 110, and 111L, EPS 125 and 126L, or EPS 140. The core of the track consists of four courses chosen from topics in mountain building and global tectonics (EPS 212), rocks and minerals (EPS 220), sedimentary rocks and processes (EPS 232 or equivalent), geochemical principles (EPS 301), isotope geochemistry (EPS 310), and structural geology (EPS 312). 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.

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 115), biology (BIOL 101 and 102, or MCDB 120, or EPS 255), and a lecture course in chemistry. The major requirements consist of at least nine term courses beyond the prerequisites. These include two courses in EPS numbered 100–140, with any accompanying laboratories; courses in natural resources (EPS 205) and

geochemical processes (EPS 220 or EPS 232 or EPS 280 or EPS 301); and five additional courses at the 200 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. tracks described above.

Credit/D/Fail Courses taken Credit/D/Fail may not be applied to the prerequisites or to the requirements of the major.

SENIOR REQUIREMENT

Seniors in both degree programs must prepare either a senior essay based on one term of library, laboratory, or field research (EPS 492) or, with the consent of the faculty, a two-term senior thesis (EPS 490, EPS 491), 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 491 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 K, Special 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.

REQUIREMENTS OF THE MAJOR

Prerequisites *B.A.* – MATH 115; BIOL 101 and 102, or MCDB 120, or EPS 255; a lecture course in chem; *B.S.* – *All tracks* – CHEM 165 or CHEM 167; MATH 120 or ENAS 151; *Atmosphere, Ocean, and Climate track* – ENAS 130 or equivalent; ENAS 194; PHYS 180, 181, 205L, 206L; *Environmental and Energy Geoscience track* – physics (PHYS 170, 171, or PHYS 180, 181, or PHYS 200, 201) or biology (BIOL 101 and 102, or MCDB 120; and BIOL 103 and 104, or E&EB 122, or EPS 125 and EPS 126L); *Paleontology and Geobiology track* – BIOL 101–104, or MCDB 120

and E&EB 122; *Solid Earth Science track* – PHYS 170, 171, or PHYS 180, 181, or PHYS 200, 201

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 tracks* – at least 11 courses, for 11 credits, beyond prereqs for letter grades (incl senior req); *Paleontology and Geobiology track* – at least 13 courses, for 12 credits, beyond prereqs for letter grades (incl senior req)

Specific core courses *B.A.* – EPS 205; 1 from EPS 220, 232, 280, or 301; *B.S.* – *Atmosphere, Ocean, and Climate track* – EPS 140, 322, 335, MENG 361, S&DS 230 or 238 or MATH 222; *Environmental and Energy Geoscience track* – 4 from EPS 205, 232, 255, 274, 275, 301, 312, 322, 362; *Paleontology and Geobiology track* – EPS 125, 126L, 4 from EPS 232, E&EB 225, EPS 255, 310, 402, S&DS 101 or equivalents; *Solid Earth Science track* – 4 from EPS 212, 220, EPS 232 or equivalent, EPS 301, 310, 312

Distribution of courses *B.A.* – 2 intro courses in EPS, with labs, as specified; 5 adtl courses at 200 level or higher in EPS or related fields; *B.S. tracks* – 1 or 2 intro courses in EPS, with labs, 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 492) or, with permission of faculty, two-term senior thesis (EPS 490, 491)

FACULTY OF THE DEPARTMENT OF EARTH AND PLANETARY SCIENCES

Professors Jay Ague, David Bercovici (*Chair*), Ruth Blake, Mark Brandon, Derek Briggs, David Evans, Alexey Fedorov, Debra Fischer, Jacques Gauthier, Shun-ichiro Karato, Jun Korenaga, Maureen Long, Jeffrey Park, Peter Raymond, Danny Rye (*Emeritus*), James Saiers, Ronald Smith (*Emeritus*), Mary-Louise Timmermans, John Wettlaufer

Associate Professor Noah Planavsky

Assistant Professors Bhart-Anjun Bhullar, Pincelli Hull, Juan Lora, Alan Rooney, Lidya Tarhan

Lecturers Michael Oristaglio

East Asian Languages and Literatures

Director of undergraduate studies: Luke Bender, (luke.bender@yale.edu) Humanities Quadrangle (HQ, 320 York Street), Room 111, (203) 432-5823

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 or the Japanese track but are encouraged to take courses in both tracks to become familiar with East Asian literary culture more broadly. The major is excellent preparation for careers including business, law, 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, medicine, academia, 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 and JAPN subject codes and are numbered 200–299 are taught in English with some sections taught in Chinese or Japanese. Courses with the subject code EALL are content courses whose focus is critical and humanistic; those numbered 200–299 are introductory, and those numbered 300–399 are advanced. Courses numbered EALL 001–099 are first-year seminars with topics on East Asian literature, film, and humanities.

PREREQUISITE

Candidates for the major must complete CHNS 140 or JAPN 140 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 who are returning from programs abroad must take a placement examination, unless the course work was completed at an institution preapproved by the Richard U. Light Fellowship program. For questions, consult with the director of undergraduate studies (DUS).

REQUIREMENTS OF THE MAJOR

The major consists of at least eleven term courses beyond the prerequisite. Students must take two terms of advanced modern Chinese (CHNS 150 and 151 or equivalents) or advanced Japanese (JAPN 150 and 151 or equivalents), as well as two terms of literary Chinese or Japanese (CHNS 170 and 171, or JAPN 170 and 171). Students also take a survey course in Chinese, Japanese, 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 200–399; one must be focused primarily on premodern content. These three may include courses on theater and film. In addition, two advanced courses with readings in literary or modern Chinese and/or Japanese are required.

Credit/D/Fail A maximum of one course taken Credit/D/Fail may be counted toward the requirements of the major, with permission of the DUS.

SENIOR REQUIREMENT

Students prepare a one-term senior essay in EALL 491 or a yearlong senior essay in EALL 492 and 493. 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.

REQUIREMENTS OF THE MAJOR

Prerequisite CHNS 140 or JAPN 140 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 track*—CHNS 150, 151 or equivalents, and 170, 171; *Japanese track*—JAPN 150, 151 or equivalents, and 170, 171

Distribution of courses 1 survey course in Chinese, Japanese, or East Asian hist and culture; 3 courses in lit in translation numbered EALL 200–399, one of them premodern; 2 adv courses with readings in Chinese and/or Japanese

Senior requirement One-term senior essay (EALL 491) or yearlong senior essay (EALL 492, 493)

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 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 certificate adviser, one advanced non-L5 course, conducted in the target language, such as an independent study course, a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one “language across the curriculum” (LxC) course, which ordinarily is an advanced seminar with an additional weekly discussion

section in the target language, to count toward the 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 those courses appear on their transcript.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

FACULTY OF THE DEPARTMENT OF EAST ASIAN LANGUAGES AND LITERATURES

Professors Kang-i Sun Chang, Aaron Gerow (*Chair*), Edward Kamens, Tina Lu, Jing Tsu

Associate Professor Michael Hunter

Assistant Professor Lucas Bender

Senior Lecturer Pauline Lin

Senior Lectors II Seungja Choi, Angela Lee-Smith, Ninghui Liang, Peisong Xu

Senior Lectors Hsiu-hsien Chan, Min Chen, Rongzhen Li, Fan Liu, Kumiko Nakamura, Hiroyo Nishimura, Jianhua Shen, Mari Stever, Wei Su, Chuanmei Sun, Haiwen Wang, Yu-lin Wang Saussy, Mika Yamaguchi, Yongtao Zhang, William Zhou

Lector Hyun Sung Lim

Affiliated Faculty Chloe Starr (*Divinity School*)

East Asian Studies

Director of undergraduate studies: Frances Rosenbluth
(frances.rosenbluth@yale.edu) [Spring 2021]; Valerie Hansen
(valerie.hansen@yale.edu); ceas.yale.edu

In the East Asian Studies major, students focus on a country or an area within East Asia and concentrate 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 concentration and one outside it. Of the course credits in the area of concentration, one must be in the premodern period, at least two must be seminars, and one is the senior requirement. 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 course work undertaken elsewhere.

Credit/D/Fail A maximum of one course taken Credit/D/Fail may be counted toward the requirements of the major, with permission of the DUS.

Roadmap See visual roadmap of the requirements.

SENIOR 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. Students may take a seminar that relates to the country or area of concentration, culminating in a senior thesis. Alternatively, students who are unable to write a senior essay in a seminar may complete a one-term senior essay in EAST 480 or a one-credit, two-term senior research project in EAST 491, 492 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 specialization. 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 concentration 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 K, Special 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.

REQUIREMENTS OF THE MAJOR

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 concentration, incl 1 in premodern era and 2 sems; 1 course credit on East Asia outside country or area of concentration

Senior requirement Senior sem culminating in senior thesis, or one-term senior essay in EAST 480, or one-credit, two-term senior research proj in EAST 491, 492 culminating in an essay

FACULTY ASSOCIATED WITH THE PROGRAM OF EAST ASIAN STUDIES

Professors Daniel Botsman (*History*), Fabian Drixler (*History*), Aaron Gerow (*East Asian Languages & Literatures; Film & Media Studies*), Valerie Hansen (*History*), Edward Kamens (*East Asian Languages & Literatures*), Tina Lu (*East Asian Languages & Literatures*), Frances Rosenbluth (*Political Science*), Helen Siu (*Anthropology*), Chloe Starr (*Divinity School*), Jing Tsu (*East Asian Languages & Literatures; Comparative Literature*), Anne Underhill (*Anthropology*), Odd Arne Westad (*Global Affairs; History*), Mimi Yiengpruksawan (*History of Art*)

Associate Professors William Honeychurch (*Anthropology*), Michael Hunter (*East Asian Languages & Literatures*), Hwansoo Kim (*Religious Studies*), Yukiko Koga (*Anthropology*)

Assistant Professors Lucas Bender (*East Asian Languages & Literatures*), Jinyi Chu (*Slavic Languages & Literatures*), Eric Greene (*Religious Studies*), Denise Ho (*History*), Daniel Mattingly (*Political Science*), Quincy Ngan (*History of Art*), Hannah Shepherd (*History*), Emma Zang (*Sociology*)

Senior Lecturer Pauline Lin (*East Asian Languages & Literatures*)

Lecturers Allison Bernard, Xuenan Cao, Julia Cross, Philip Gant, Na Sil Heo, Alex Finn Macartney, Kyle Shernuk, Trenton Wilson

Senior Lectors II Seungja Choi, Angela Lee-Smith

Senior Lectors Hsiu-hsien Chan, Min Chen, Rongzhen Li, Ninghui Liang, Fan Liu, Kumiko Nakamura, Hiroyo Nishimura, Yu-lin Wang Saussy, Jianhua Shen, Mari Stever, Wei Su, Chuanmei Sun, Haiwen Wang, Peisong Xu, Mika Yamaguchi, Yongtao Zhang, William Zhou

Lector Hyun Sung Lim

Ecology and Evolutionary Biology

Director of undergraduate studies: Richard Prum (richard.prum@yale.edu); eeb.yale.edu

The Department of Ecology and Evolutionary Biology (E&EB) 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.A. and a B.S. degree. 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. The B.S. program is designed for students planning to pursue graduate study in ecology and evolutionary biology, other biological disciplines, or the environmental sciences, or to attend medical or veterinary school. The two programs share the same prerequisites and core requirements but differ in their electives and senior requirements.

Students majoring in E&EB select one of two concentrations. The concentration in *Biodiversity and Environment* (formerly Track 1) emphasizes courses appropriate for careers in ecology, evolutionary biology, and environmental science; the concentration in *Organismal Biology* (formerly Track 2) is appropriate for premedical and preveterinary students because it allows them to use as electives many courses required by medical schools. The E&EB major offers opportunities for independent research in both laboratory and field.

COURSES FOR NONMAJORS

Several E&EB courses have no college-level prerequisites and are suitable for nonmajors. These include all 100-level offerings as well as 200-level courses that deal with particular organism groups such as plants, fish, mammals, birds, and insects or other invertebrates.

PREREQUISITES

The prerequisites for the major are intended to provide core scientific literacy; they include courses in biology, chemistry, physics, and mathematics. The introductory biology sequence BIOL 101, 102, 103, and 104 is required. Also required are a two-term lecture sequence in general chemistry, CHEM 161, 165 or CHEM 163, 167, taken with associated laboratories, CHEM 134L and 136L; and one term of organic chemistry, CHEM 174 or 175, or CHEM 220 or 221, with associated laboratories, CHEM 222L or 223L. Optionally, CHEM 174, 175, taken with CHEM 222L, 223L, satisfies both chemistry requirements. Two terms of lecture courses in physics are required, PHYS 170, 171 or higher, and one term of mathematics (MATH 115 or 116) or one term of statistics & data science (S&DS 100 or 230). A different statistics course approved by the director of undergraduate studies (DUS) may be substituted for the mathematics prerequisite.

A new 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 prerequisites for the E&EB major. Students who have mathematics preparation equivalent to MATH 115 or higher are encouraged to take a statistics course (usually S&DS 101–106) and/or additional mathematics or statistics courses such as MATH 120, 121, 222 or 225 or MATH 226 and S&DS 220 or 230. Because chemistry courses are prerequisite to several E&EB courses, students are strongly urged to take general and organic chemistry in the first and sophomore years. Students who place out of general chemistry should take organic chemistry during their first year. Finishing the prerequisites early allows for a more flexible program in later years.

PLACEMENT PROCEDURES

Students can place out of the introductory biology sequence (BIOL 101, 102, 103, 104) only by means of the biology placement examination administered jointly by the biological science departments, E&EB, MB&B, and MCDB.

Potential E&EB majors are expected to take the mathematics placement test. Those who place above the level of MATH 112 may proceed to prerequisite courses for the E&EB major; those who place into MATH 112 must take that course before other prerequisites.

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

B.A. degree program Beyond the prerequisites, the B.A. requires three lecture courses and one laboratory, for three and one-half course credits, and the senior requirement. In *Biodiversity and the Environment*, the required courses are E&EB 220, 225, and a lecture course on organismal diversity usually chosen from E&EB 246–272, along with its associated laboratory, or E&EB 326 and 327L. Other lecture courses on organismal diversity, with laboratory, are permitted with approval of the DUS, including MCDB 290 and 291L. Required courses in *Organismal Biology* include E&EB 290; E&EB 295 or BENG 350; MCDB 300 or MB&B 300; and E&EB 291L.

B.S. degree program The B.S. requirements are the same as those for the B.A., with the addition of at least two electives, for two course credits, in both concentrations. At least one of the electives must be a lecture or a seminar. Most E&EB, 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.

Substitutions permitted Two upper-level courses in Earth and Planetary Sciences (excluding paleobiology courses), Mathematics, Applied Mathematics, Applied Physics, Computer Science, Statistics and Data Science, or Engineering and Applied Science can be substituted for the required term of organic chemistry and laboratory, and courses from different majors can be combined to meet this requirement. A second term of organic chemistry and laboratory and up to two terms of physics laboratories are allowed as electives. Courses from other departments may also be suitable as electives.

All substitutions require the permission of the DUS. Residential College Seminars may not be counted toward the requirements of the major.

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 E&EB 469 and E&EB 474. For information on how to become involved in research, see the E&EB Guide to Research and Research Opportunities. For information on fellowships and summer experiences, see the E&EB 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 K, Special 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 counted toward the E&EB major.

Roadmap See visual roadmap of the requirements.

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 E&EB 470 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.

B.S. degree program Students in the B.S. degree program fulfill the senior requirement by completing two terms of original research in E&EB 475 and 476, or in 495 and 496.

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 E&EB website. Students in E&EB should consult one of the advisers assigned to their class (see below). The course schedules of all E&EB majors (including sophomores intending to major in E&EB) must be signed by a faculty member in E&EB; 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.

Class of 2021: David Post

Class of 2022: Gisella Caccone and Richard Prum

Class of 2023: Martha Munoz and Marta Wells

Class of 2024: Richard Prum

Peer Mentors provide a helpful student perspective to navigating the major and the department. You 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. Credit for such programs may apply toward the major; interested students should consult the DUS prior to going abroad.

REQUIREMENTS OF THE MAJOR

Prerequisites Introductory biology sequence (BIOL 101, 102, 103, 104); 2-term general chemistry lecture sequence (CHEM 161, 165 or CHEM 163, 167) with labs (CHEM 134L, 136L); 1 term of organic chemistry (CHEM 174 or 175, or CHEM 220 or 221) with labs (CHEM 222L or 223L); alternatively, CHEM 174, 175 taken with CHEM 222L, 223L satisfies both chemistry requirements; 2 terms of lecture courses in physics (PHYS 170, 171 or higher); 1 term of MATH 115, MATH 116, S&DS 100 or S&DS 230

Number of courses *B.A.* – 3½ course credits beyond prereqs (not incl senior req); *B.S.* – 5½ 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* – E&EB 220, 225; 1 from E&EB 246–272 with lab, or E&EB 326 and 327L; *Organismal Biology* – E&EB 290; E&EB 295 or BENG 350; MCDB 300 or MB&B 300; and E&EB 291L

Distribution of courses additionally for the *B.S.* – 2 electives as specified

Substitutions permitted With DUS permission, other math or stat course for math or stat prereq; two upper-level courses in EPS, MATH, AMTH, APHY, CPSC, S&DS, or ENAS for organic chemistry and lab; a second term of organic chemistry and lab and two physics labs may count as electives

Senior requirement *B.A.* – E&EB 470 or senior essay; *B.S.* – two terms of E&EB 475 and 476, or 495 and 496

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: Ebonya Washington

(ebonya.washington@yale.edu), Room 36, 37 Hillhouse Ave., 432-9901; registrar: Qazi Azam, (qazi.azam@yale.edu) Room 101A, 28 Hillhouse Ave., 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.

Those with economics training find employment in government agencies, nonprofits, and, of course, economic consulting and investment banking. In addition to pursuing advanced degrees in economics, economics majors also go on to do graduate work in law, medicine, and business.

INTRODUCTORY COURSES

Introductory courses in microeconomics, macroeconomics, and data analysis and econometrics serve students considering a major in Economics, as well as others who seek an introduction to the subject. ECON 115 is concerned with microeconomics and includes such topics as markets, prices, production, distribution, and the allocation of resources. ECON 116 covers such macroeconomic issues as unemployment, inflation, growth, and international economics. ECON 117 introduces students to basic aspects of working with data to answer economic questions, as well as to the fundamentals of statistical analysis. ECON 116 and 117 have microeconomics as a prerequisite.

Despite the numbering, students may wish to take ECON 117 before or concurrently with ECON 116, as the data skills taught in ECON 117 may be helpful in ECON 116. ECON 115, 116, and 117 are lecture courses with accompanying discussion sections.

First-year students and sophomores looking for smaller, slightly more discussion-oriented versions of introductory microeconomics and macroeconomics may enter a lottery for admission to ECON 110 and 111. Those with little or no experience in calculus may be better served by ECON 108, which covers microeconomics with greater discussion of quantitative methods and examples. ECON 108, 110, and 115 are similar in substance; ECON 111 and 116 are similar in substance as well. A student may receive credit for only one course each in introductory microeconomics and introductory macroeconomics.

The department recommends that students interested in majoring in Economics take at least two introductory economics courses in the first year. In order 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.

PLACEMENT AND EXEMPTIONS FOR INTRODUCTORY COURSES

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 allowed to place out of the corresponding introductory course and instead enroll in intermediate-level courses (ECON 121 or 125 for microeconomics, ECON 122 or 126 for macroeconomics). Students who have the requisite AP Economics score but not the corresponding AP Calculus score may take calculus (e.g., MATH 112, MATH 115, 116, 118, or 120 or ENAS 151 / APHY 151 / PHYS 151), and then place out of the corresponding introductory economics course. Students may substitute a score of 7 on the International Baccalaureate higher-level Economics examination or A on the GCE A-level Economics examination for AP test scores of 5 in economics. In addition, a score of 7 on the International Baccalaureate higher-level Mathematics examination or A on the GCE A-level Mathematics examination may be substituted for a qualifying AP Calculus score.

Placing out of introductory courses does not decrease the number of courses required to complete the economics major. Students must substitute courses from which they place out of with higher-level courses.

Because of its emphasis on data analysis, the department recommends that even students with a background in statistics begin their econometrics and data analysis training with ECON 117.

REQUIREMENTS OF THE MAJOR

Students majoring in Economics are required to take twelve term courses. Two of these courses are introductory microeconomics and introductory macroeconomics. All majors must also take the following courses: one term of intermediate microeconomics (ECON 121 or 125) and one term of intermediate macroeconomics (ECON 122 or 126); a course in data analysis and econometrics, generally ECON 117; and one Yale mathematics course, usually selected from MATH 112, 115, 118, or 120. ENAS 151 may also be used to meet the math requirement. The department recommends that students also take ECON 123, a course in econometrics and data analysis at the intermediate level. All of the aforementioned required courses should be completed prior to the senior year. Students who wish to write a senior essay are also required to complete a second semester of econometrics either before or concurrently with writing the senior essay; at least one of the two econometrics courses should include work in data analysis. All majors must also take two courses numbered ECON 400–491, at least one of which must be taken in the senior year.

Subject to approval by the director of undergraduate studies (DUS), students may count toward the major one course related to economics but taught in another field, in addition to the required course in mathematics.

Mathematics 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 118 or 120. Students who place out of these mathematics courses must take a higher-level mathematics course at Yale and should consult the DUS for help choosing a course. Students who intend to pursue a graduate degree in economics should take additional math courses, including linear algebra (MATH 222 or 225 or 226) and real analysis (MATH 300 or 301).

Data analysis and econometrics Students are strongly advised to take a two-term sequence of data analysis and econometrics courses, especially if they are interested in a research experience on or off campus. The statistical 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. Most students should take ECON 117, followed by 123. 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 either ECON 135 or S&DS 241 and S&DS 242, followed by ECON 136. (Note: S&DS 241 and 242 together count as one course towards the economics major. Further note that neither ECON 135 nor S&DS 241 and 242 fulfill the major's requirement of one econometrics course as they are courses in probability and statistics that are prerequisites for ECON 136, a course in econometrics. However, either ECON 117 or ECON 123 fulfills the econometrics requirement.) Prospective majors are urged to start their econometrics sequence by the fall of sophomore year.

Intermediate microeconomics and macroeconomics Two course options are available in both microeconomics and macroeconomics. The standard intermediate courses are ECON 121 and 122. Students with a stronger mathematics background who are interested in a more theoretical treatment of the material are encouraged to take ECON 125 and 126 instead. The intermediate courses need not be taken in sequence: in particular, ECON 125 is not required for 126; ECON 121 is not required for 122.

Field courses The department offers a wide selection of upper-level courses that explore in greater detail material presented in introductory courses. Advanced fields of economics include theoretical, quantitative, and mathematical economics; market organization; human resources; finance; international and development economics; public finance; health; labor; inequality; environmental economics; and economic history. Some field 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.

Advanced lecture courses Advanced lecture courses, generally numbered ECON 400–449, are limited-enrollment courses that cover relatively advanced material in more depth than regular field courses. Prerequisites usually include several courses in intermediate microeconomics, intermediate macroeconomics, and econometrics, or a mathematics course such as MATH 120. 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.

Seminars Although there is diversity in approaches in the various seminars (courses generally numbered ECON 450–489), 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. Seminars may be applied toward the senior requirement.

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 nonmajors may enroll in Economics seminars and advanced lecture courses as space permits, but they may not enter preference selection.

Distinction in the Major To be considered for Distinction, students must meet the appropriate grade standards as described in this bulletin under Honors and submit a senior essay to the Economics department. Only those majors who submit a senior essay earning a grade of A or A- are eligible for Distinction. Students who fail to submit an essay will not be considered for Distinction. Grade computation for Distinction does not include the introductory micro- and macroeconomics courses, the required mathematics course, or courses taken outside Yale. Economics courses taken beyond the requirements of the major are counted toward the Distinction calculation.

Credit/D/Fail Courses taken Credit/D/Fail and Residential College Seminars may not be counted toward the requirements of the major.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

Majors are required to take two departmental courses numbered ECON 400-491, at least one of which must be taken in the senior year. The senior requirement must be met by taking Yale Economics courses.

Senior essay There are four 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 (ECON 491); (2) students may write a two-term essay starting in the fall and continued into the spring 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 (ECON 491 and ECON 492); (3) students may write a one-term essay in an advanced departmental course (numbered 400-489) taken during the fall term of the senior year; or (4) students may write a two-term essay beginning in an advanced departmental course (numbered 400-489) taken during the fall term, and completed in the spring of the senior year as an independent project under the close and regular supervision of a faculty adviser (ECON 492). Under this final option the instructor of the advanced departmental course taken in the fall term typically serves as the faculty adviser for the full academic year.

Note that the essay must be written during the senior year and that students may submit a senior essay only if they have an approved prospectus and a senior essay adviser. Late essays will not be accepted without a dean's note.

Students are required to complete a second semester of econometrics either before or concurrently with writing the senior essay; at least one of the two econometrics courses should include work in data analysis.

Only those majors who submit a senior essay earning a grade of A or A- are eligible for Distinction in the Major.

Meetings for seniors to discuss the senior essay guidelines and requirements will be held just before the start of the academic year. Time and format are to be announced. Senior essay prospectus forms are due Monday, October 4, 2021. Students who fail to turn in a prospectus with adviser's signature by that date will not be permitted to write a senior essay.

ADVISING

The Economics department has faculty representatives/advisers for each residential college. Students majoring in economics should consult with an economics adviser for their college during course enrollment. Questions concerning the major or programs of study may also be directed to the college representative. College representatives can be found on the department website.

Transfer credits 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 economics courses taken outside Yale do not meet the requirements of the Economics major; students should consult with the DUS before taking such courses. Courses taken outside of Yale's Economics department may not be counted toward the major requirements in introductory microeconomics, introductory macroeconomics, intermediate microeconomics, intermediate macroeconomics, econometrics, mathematics, or the senior requirement. See the department website section on transferring credits.

Graduate courses Well-qualified students who have acquired the requisite background in undergraduate courses may, with written permission of the instructor, the DUS, and the director of graduate studies, 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Distribution of courses 2 introductory classes, one in microeconomics and one in macroeconomics; 3 core courses (intermediate micro ECON 121 or 125, intermediate macro ECON 122 or 126, and a course in data analysis and econometrics); 1 math course; 4 electives (one of which may be a second semester of econometrics)

Substitution permitted 1 related course in another dept, with DUS approval

Senior requirement 2 senior seminar/lectures, numbered ECON 400–491, at least 1 in senior year, as indicated

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, Timothy Guinnane, Philip Haile, Marina Halac, Johannes Horner, Gerald Jaynes, Yuichi Kitamura, Alvin Klevorick, Samuel Kortum, Naomi Lamoreaux, Giovanni Maggi, Konstantinos Meghir, Giuseppe Moscarini, Kaivan Munshi, William Nordhaus, Gerard Padró i Miquel, Rohini Pande, Benjamin Polak, Mark Rosenzweig, Larry Samuelson, Anna Sanktjohanser, Katja Seim, Robert Shiller, Anthony Smith, Aleh Tsyvinski, Edward Vytlačil, Ebonya Washington, Fabrizio Zilibotti

Associate Professors Mitsuru Igami, Ilse Lindenlaub, Michael Peters, Philipp Strack

Assistant Professors Eduardo Dávila, Jose-Antonio Espin-Sanchez, Mira Frick, Charles Hodgson, John Eric Humphries, Zhen Huo, Ryota Iijima, Yusuke Narita, Cormac O'Dea, Nicholas Ryan, Anna Sanktjohanser

Senior Lecturers Marnix Amand, Michael Boozer, Evangelia Chalioti, William Hawkins, Tolga Koker, Guillermo Noguera, Soenje Reiche, María Saez Martí, Rebecca Toseland

Lecturers Jaime Arellano-Bover, Daniela Morar, Katerina Simons

Economics and Mathematics

Directors of undergraduate studies: Ebonya Washington

(ebonya.washington@yale.edu) (Economics), Rm. 36, 37 Hillhouse Ave., 432-9901; Andrew Neitzke (Mathematics), DL 425; associate director of undergraduate studies: Miki Havlickova (miki.havlickova@yale.edu) (Mathematics), DL 446; Qazi Azam (qazi.azam@yale.edu) (registrar)

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 120; ECON 110 or 115; and ECON 111 or 116. With permission of the directors of undergraduate studies (DUSes), upper-level courses may be substituted for prerequisite courses. 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

A total of twelve term courses is required beyond the introductory level in economics and in mathematics: seven term courses in economics and five term courses in mathematics numbered above 200 (except MATH 470). These courses must include:

1. One intermediate microeconomics course chosen from ECON 121 or 125, and one intermediate macroeconomics course chosen from ECON 122 or 126.
2. A year of mathematical economics, ECON 351 and one of ECON 350, 417, or 433.
3. Two courses in econometrics, ECON 135 and 136. With permission of the DUS in Economics, S&DS 241 and 242 may be taken instead of ECON 135, in which case they count as one economics course and not as mathematics courses. Neither S&DS 241 nor 242 can be counted toward the major in parallel to ECON 135.
4. **Students in the Class of 2025 and beyond** must complete linear algebra (MATH 222 or 225 or 226) and real analysis (MATH 255 or 256). **Students in the Class of 2024 and previous classes**, may use MATH 300, 301, or 305 to fulfill the real analysis requirement (in place of MATH 255 or MATH 256). They may also use MATH 231 to fulfill the linear algebra requirement (in place of MATH 222 or 225 or 226).

A course must be listed with a MATH number to count toward the mathematics requirements—substitutions from other departments are not allowed.

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-. One-term essays may be written in either an Economics department senior seminar or in ECON 491. Two-term senior essays may be written in either an Economics senior seminar and ECON 492 or in ECON 491 and 492. (The paper must be written in a course or courses taken in the senior year.) For details see Economics. All courses

beyond the introductory level in Mathematics and Economics are counted in the computation of grades for Distinction.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

SENIOR REQUIREMENT

Students must take the senior seminar in mathematics, MATH 480 or 481. A senior essay in Economics is optional.

ADVISING

Students interested in the major should consult both DUSes, and verify with each that their proposed program meets the relevant guidelines. Registration forms must be signed by both DUSes each term.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 120; ECON 110 or 115; ECON 111 or 116

Number of courses 12 term courses beyond prerequisites (incl senior req)

Distribution of courses 7 courses in econ and 5 in math

Specific courses required ECON 121 or 125; ECON 122 or 126; ECON 135; ECON 136; ECON 350, 417 or 433; ECON 351; MATH 222 or 225 or MATH 226; MATH 255 or MATH 256 as specified

Substitution permitted S&DS 241 and 242 for ECON 135, with permission of Economics DUS; MATH 300 or 301 may be substituted for MATH 255 or MATH 256. MATH 231 may be used to fulfill the linear algebra requirement, replacing MATH 222 or 225 or 226

Senior requirement Senior sem in math (MATH 480 or MATH 481); optional senior essay in economics

Education Studies

Executive director: Mira Debs (mira.debs@yale.edu), Rm 408, 493 College St., 432-4631; <https://educationstudies.yale.edu/>, Program FAQ

Students seeking to engage with Education Studies can pursue one of two pathways alongside their major: the Multidisciplinary Academic Program (MAP), with a focus on research and learning with a cohort of Yale students, or the uncapped Education Studies Certificate.

Any Yale College student interested in education studies may take the introductory survey course, EDST 110, Foundations in Education Studies. This uncapped lecture course explores the historical, social, philosophical, and theoretical underpinnings of the field and helps students to understand the critical role of education in society through research, policy, and practice.

EDUCATION STUDIES MULTIDISCIPLINARY ACADEMIC PROGRAM

The Education Studies Multidisciplinary Academic Program (MAP) in Yale College provides a structure for students interested in the research, policy, and practice of education. By virtue of studying education at Yale, students engage in the interdisciplinary study of a primary institution impacting citizenship, governance, social reproduction, child development, and social inequality. Yale courses across the disciplines address these varying aspects of education through two area categories: (1) social contexts and policy and (2) individuals and society.

In the fall of the sophomore year, students who have successfully completed or are currently enrolled in EDST 110 may apply to become a Yale Education Studies Scholar alongside their major course of study. Selected students join a cohort of twenty-five undergraduate peers who study education together over two-and-a-half years through coursework and other events. They are closely guided by faculty, peers, and alumni towards educational opportunities tailored to their individual interests. Education Studies Scholars also gain practical field experience through an appropriate academic-year educational opportunity or summer field experience.

To fulfill the requirements of the program, students must complete six courses including EDST 110, EDST 261; a field experience; two or three electives (depending on senior requirement), with at least one elective in each area category; and one or two senior capstone courses including EDST 400 alone or in combination with EDST 410 or 490. Two of the six courses may overlap with the student's major. Graduate and professional school courses may count, with approval from the Education Studies director. For a listing of courses in the area categories, see the Education Studies website. You may also search for approved courses in Yale Course Search by searching for the following attributes: EDST: Social Context and EDST: Indv Society.

Transcripts will have notation indicating successful completion of the MAP. Students may not earn both the Education Studies MAP and the Education Studies Certificate.

The curricular changes to the Education Studies MAP are applicable to the class of 2023 and subsequent classes. The class of 2022 is permitted to opt in to these changes.

REQUIREMENTS OF THE MULTIDISCIPLINARY ACADEMIC PROGRAM

Prerequisite EDST 110

Number of courses 6 courses (incl prereq, EDST 261 and senior req)

Distribution of courses 2 or 3 electives (depending on senior req) with at least one elective in each concentration area

Other requirement Field experience as described on the EDST website

Senior requirement EDST 400 alone or in combination with EDST 410 or 490

CERTIFICATE IN EDUCATION STUDIES

Certificate director: Mira Debs (mira.debs@yale.edu), Rm 408, 493 College St., 432-4631; <https://educationstudies.yale.edu/>

This certificate, available to all interested Yale Students, provides the opportunity for students to pursue a focused study, in addition to their major, that will strengthen their liberal arts education. By virtue of studying education at Yale, students engage in the interdisciplinary study of a primary institution impacting citizenship, governance, social reproduction, child development, and social inequality. Yale courses across the disciplines address these varying aspects of education through two area categories: (1) social contexts and policy and (2) individuals and society. To earn the certificate, students must take EDST 110, one course in each of the two area categories, 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, a multidisciplinary academic program, 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, with approval from the certificate director.

For a listing of courses in the area categories, see the Education Studies Courses web page. You may also search for approved courses in Yale Course Search by searching for the following attributes: EDST: Social Context and EDST: Indv Society.

Completion Procedure and Advising Students interested in completing the Education Studies Certificate should contact certificate director mira.debs@yale.edu (mira.debs@yale.edu) to receive a declaration form. Students may do so as early as their first year. The declaration form must be submitted no later than the due date for course schedules in the student's final term of enrollment. Transcripts will have notation indicating successful completion of the certificate. Students may not earn both the Education Studies MAP and the Education Studies Certificate.

REQUIREMENTS OF THE CERTIFICATE

Number of courses 5 term courses

Specific course required EDST 110

Distribution of courses one course credit each of two area categories: (1) social contexts and policy, and (2) individuals and society; 2 EDST electives

Electrical Engineering

Director of undergraduate studies: Mark Reed (mark.reed@yale.edu), 523 BCT, 432-4306; seas.yale.edu/departments/electrical-engineering

Electrical Engineering broadly encompasses disciplines such as microelectronics, photonics, computer engineering, signal processing, control systems, and communications. 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 112 and MATH 115 if applicable, ENAS 151 or MATH 120 or higher, ENAS 130 (CPSC 100 and 112 do not fulfill this requirement), and PHYS 180, 181 or higher (PHYS 170, 171 is acceptable for the B.A. degree). Acceleration credits awarded on entrance can be used to satisfy the MATH 112 and 115 requirements. Students whose preparation exceeds the level of ENAS 151 or MATH 120 are asked to take a higher-level mathematics course instead, such as MATH 222, MATH 225, MATH 226, MATH 255, or MATH 256. Similarly, students whose preparation at entrance exceeds the level of PHYS 180, 181 are asked to take higher-level physics courses instead, such as PHYS 200, 201. Students whose programming skills exceed the level of ENAS 130 are asked to take a more advanced programming course instead, such as CPSC 201; consult with the director of undergraduate studies (DUS).

For students in the Class of 2023 and subsequent classes, 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 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 194; MATH 222 or MATH 225 or MATH 226; APHY 322 or equivalent; S&DS 238, or S&DS 241, or equivalent.
2. Electrical engineering and related subjects (thirteen term courses): EENG 200, 201, 202, 203, 310, 320, 325, 348, and 481 (the ABET design project senior requirement); and four engineering electives, at least three of which should be at the 400 level. CPSC 365 or CPSC 366, MENG 390, MENG 403, BENG 411, PHYS 430, APHY 458, and all 400-level computer science courses qualify as ABET electives. One of EENG 468 or EENG 469, Advanced Special Projects, also qualify as a 400-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 EENG 200 and EENG 202, followed by EENG 201 and EENG 203 in the spring term. These courses may be taken in any order, with the exception of EENG 203, which requires EENG 200 as a prerequisite. In this case, it would be helpful to take ENAS 194 and/or ENAS 130 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 112 and MATH 115) could include:

First Year: EENG 200, EENG 201, ENAS 151, PHYS 180, and PHYS 181
 Sophomore: EENG 202, EENG 203, ENAS 130, ENAS 194, and MATH 222
 Junior: EENG 310, EENG 320, EENG 325, EENG 348, S&DS 238, and 1 elective
 Senior: APHY 322, EENG 481, 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 151, ENAS 130, ENAS 194, PHYS 180, and PHYS 181
 Sophomore: EENG 200, EENG 201, EENG 202, EENG 203, and MATH 222
 Junior: EENG 310, EENG 320, EENG 325, EENG 348, S&DS 238, and 1 elective
 Senior: APHY 322, EENG 481, 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 112 and MATH 115) and only seek to fulfill basic distribution requirements with no engineering courses, could be:

First Year: MATH 112, MATH 115, PHYS 180, PHYS 181, and ENAS 130
 Sophomore: ENAS 151, EENG 200, EENG 201, EENG 202, EENG 203, and MATH 222
 Junior: ENAS 194, EENG 310, EENG 320, EENG 325, EENG 348, and S&DS 238
 Senior: APHY 322, EENG 481, 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 222 or MATH 225 or MATH 226; ENAS 194; EENG 200, 201, 202, 203; EENG 471 and/or 472 (the senior requirement), or with permission of the instructor and the DUS, 481; and five or six electives (depending on senior requirement) approved by the DUS, at least three of which must be at the 400 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 112 and MATH 115), a sample schedule for the B.S. degree in Engineering Science (Electrical) could be:

First Year: EENG 200, EENG 201, ENAS 151, PHYS 180, and PHYS 181
 Sophomore: EENG 202, EENG 203, ENAS 130, ENAS 194, and MATH 222
 Junior: 3 electives
 Senior: EENG 471 and/or 472, 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 222, MATH 225, MATH 226 or ENAS 194; EENG 200, 201, 202, and 471 and/or 472 (the senior requirement); and two (or three) approved electives.

Credit/D/Fail For students in the Class of 2023 and subsequent classes, courses taken Credit/D/Fail may not be counted toward the requirements of the major, including the prerequisites.

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 EENG 471 and/or 472, or 481, present a written report, and make an oral presentation. Students taking both EENG 471 and 472, 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 EENG 471, 472, or 481 are strongly suggested to be made during the term preceding enrollment in the course. Independent research courses (EENG 468 or EENG 469) are graded on a Pass/Fail basis, but one (1) can be counted toward the requirements of the major.

REQUIREMENTS OF THE MAJOR

ELECTRICAL ENGINEERING, B.S.

Prerequisites MATH 112, 115 if needed; ENAS 151 or MATH 120 or higher; ENAS 130; PHYS 180, 181 or higher

Number of courses 17 term courses beyond prereqs, incl senior req

Specific courses required ENAS 194; MATH 222 or MATH 225 or MATH 226;

APHY 322; S&DS 238 or S&DS 241; EENG 200, 201, 202, 203, 310, 320, 325, 348

Distribution of courses 4 engineering electives, 3 at 400 level

Senior requirement One-term design project (EENG 481)

ENGINEERING SCIENCES (ELECTRICAL), B.S. AND B.A.

Prerequisites *Both degrees* – MATH 112, 115; ENAS 151 or MATH 120 or higher; ENAS 130; *B.S.* – PHYS 180, 181 or higher; *B.A.* – PHYS 170, 171 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 194; MATH 222 or MATH 225 or MATH 226; EENG 200, 201, 202, 203; *B.A.* – 1 from ENAS 194, MATH 222, MATH 225, or MATH 226; EENG 200, 201, 202

Distribution of courses *B.S.* – 5 or 6 electives approved by DUS, 3 at 400 level; *B.A.* – 2 or 3 electives approved by DUS

Senior requirement *B.S.* – one or two-term research or design project (EENG 471 and/or 472 or, with permission of DUS, 481); *B.A.* – one or two-term research or design project (EENG 471 and/or 472)

FACULTY OF THE DEPARTMENT OF ELECTRICAL ENGINEERING

Professors †Hui Cao, †James Duncan, Jung Han, Roman Kuc, Tso-Ping Ma, Rajit Manohar, A. Stephen Morse, Kumpati Narendra, †Daniel Prober, Mark Reed, Peter Schultheiss (*Emeritus*), †Lawrence Staib, †Hemant Tagare, Hongxing Tang, Leandros Tassioulas, J. Rimantas 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: Mark Reed (mark.reed@yale.edu) (Electrical Engineering), 523 BCT, 432-4306; James Aspnes (james.aspnes@yale.edu) (Computer Science), 401 AKW, 432-1232

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 112, 115 (these prerequisites may be waived for students who have taken the equivalent of one year of calculus in high school) and ENAS 151 or MATH 120 (or a higher level course); CPSC 112 (for students without previous programming experience); and PHYS 180 and 181, or 200 and 201. PHYS 170, 171 are acceptable for students taking MATH 112. 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

B.S. degree program The major requires fifteen term courses beyond the prerequisites: CPSC 201, 202, 223, 323, and 365 or 366; EENG 200, 201, 202, and 203; one from MATH 222, 225, 226, S&DS 238, or S&DS 241; four advanced electives, two in electrical engineering, two in computer science; and a senior project. MATH 244 may be substituted for CPSC 202. Electives must be 300- or 400-level courses in the departments of Electrical Engineering and Computer Science, or must be approved by the DUSes of both departments. Double-titled courses may be counted either way to fulfill this requirement. CPSC 280 and 490 may not be used as electives. With permission of the DUSes of both departments, one of EENG 468 or 469 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
EENG 200	CPSC 201	CPSC 202	Senior project
ENAS 151	EENG 202	CPSC 323	One elective
PHYS 180			
EENG 201	CPSC 223	CPSC 365 or 366	Two electives
PHYS 181	EENG 203	One elective	
	MATH 222		

Students with no programming experience should take CPSC 112 in the fall of their first year and either postpone EENG 200 until their sophomore year or take ENAS 151 or MATH 120 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 112	CPSC 201	CPSC 202	Two electives
MATH 115	EENG 200	CPSC 323	
PHYS 180	EENG 202	S&DS 241	
EENG 201	CPSC 223	CPSC 365 or 366	Senior project
MATH 120	EENG 203	One elective	One elective
PHYS 181			

For students with no calculus and no programming experience, a typical program would be:

First-Year	Sophomore	Junior	Senior
CPSC 112	CPSC 201	CPSC 202	Two electives
MATH 112	EENG 200	CPSC 323	
PHYS 170	ENAS 151	EENG 202	
EENG 201	CPSC 223	CPSC 365 or 366	Senior project
MATH 115	MATH 222	EENG 203	One elective
PHYS 171		One elective	

Students who start with MATH 112 may satisfy the physics prerequisite by taking PHYS 170 and 171 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 Courses taken Credit/D/Fail may not be counted toward the requirements of the major, including prerequisites.

SENIOR REQUIREMENT

The senior project must be completed in CPSC 490 or EENG 471 and/or 472, 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.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 112, 115, and ENAS 151 or MATH 120; CPSC 112 (students without previous programming experience); PHYS 180, 181, or 200, 201 with exceptions as indicated

Number of courses 15 term courses beyond prerequisites (including senior project)

Specific courses required CPSC 201, 202, 223, 323, and 365 or 366; EENG 200, 201, 202, and 203; one from MATH 222, 225, 226, S&DS 238 or S&DS 241

Distribution of courses 4 additional 300- or 400-level electives, 2 in electrical engineering, 2 in computer science

Substitution permitted MATH 244 for CPSC 202; advanced courses in other depts, with permission of DUS in each department

Senior requirement Independent project (CPSC 490 or EENG 471 and/or 472) approved by DUS in each department

Energy Studies

Program director: Michael Oristaglio (michael.oristaglio@yale.edu); earth.yale.edu/energy-studies

ENERGY STUDIES MULTIDISCIPLINARY ACADEMIC PROGRAM

Energy Studies is one of four multidisciplinary academic programs in Yale College. The curriculum is designed to provide select undergraduates with the broad knowledge and skills needed for advanced studies, leadership, and success in energy-related fields. The course of study is divided into three tracks – Energy Science and Technology; Energy and Environment; and Energy and Society – and requires the completion of two courses in each of the three tracks, plus a senior capstone project, which may take many forms, such as independent study, a summer internship, a senior essay, or a senior project. The Senior Capstone Seminar, ENRG 400, offered in the spring term, allows students to complete the capstone in a credited Yale College course.

Admission to the Energy Studies Undergraduate Scholars program is by application in the fall term of sophomore year. Energy Studies Scholars must complete the requirements of a Yale College major. Yale College does not offer a major in energy studies. For additional information, visit the program website.

Credit/D/Fail Only one course taken Credit/D/Fail or one independent study course graded Pass/Fail may be counted toward the program.

REQUIREMENTS OF THE PROGRAM

Prerequisites None

Number of courses 6 term courses

Distribution of courses At least two courses in each of the three tracks of Energy Studies listed above, and no more than two required courses from a student's major can be used to satisfy the six-course requirement

Senior requirement Senior capstone project, as indicated

Engineering

Dean of the School of Engineering & Applied Science: Mitchell Smooke, 105 17 HLH, 432-4200, engineering@yale.edu; seas.yale.edu

Engineering programs are offered in the departments of Biomedical Engineering, Chemical and Environmental Engineering, Computer Science, Electrical Engineering, and Mechanical Engineering and 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 that allow 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 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 Mathematics, Biomedical Engineering, Chemical Engineering, Computer Science, Electrical Engineering, Engineering and Applied Science, Environmental Engineering, 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) 107 LC, 432-2224; **associate director of undergraduate studies:** Joseph North (joseph.north@yale.edu), 107 LC, 432-2224; **registrar:** Erica Sayers (erica.sayers@yale.edu), 106 LC, 432-2226; **assistant registrar:** Jane Bordiere (jane.bordiere@yale.edu), 107 LC, 432-2224; 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 Courses numbered from 114–130 are introductory and are open to all students in Yale College. Students planning to elect an introductory course in English should refer to the department website for information about preregistration. Once preregistered, students must attend the first and all subsequent course meetings for that particular section until the end of the second week of classes in order to retain a place. If a student misses a class meeting during this period without informing the instructor beforehand, his or her place will immediately be filled from the waiting list. Students may change their section by attending the desired section. If there are no available seats, the student may be placed on the waiting list for that section.

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 introductory courses that concentrate on the writing of expository prose (ENGL 114, 115, 120, and 121), the English department offers a number of creative writing courses. The introductory creative writing course, ENGL 123, is open to any student who has not taken an intermediate or advanced course in the writing

of fiction, poetry, or drama. Interested students must preregister for ENGL 123, but they need not submit a writing sample to gain admission. 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 487), 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 125, 126, 127, 128. Prospective English majors are strongly encouraged to complete these requirements by the end of the sophomore year. Those who have not enrolled in the Directed Studies program should also consider taking both ENGL 129 and 130, foundational courses in the European literary tradition.

If, due to a late change of major or other circumstance, it is impossible to take three foundational courses, students may satisfy the requirements of the major by substituting for one foundational course (1) DRST 001 and 002, (2) ENGL 129 and 130, or (3) two advanced courses that deal substantially and intensively with similar material. All substitutions require permission from the director of undergraduate studies (DUS).

REQUIREMENTS OF THE MAJOR

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 125, 126, 127, and 128; (2) at least one advanced course (numbered 131 or higher) 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 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 upper-level 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 creative writing courses toward the English major. ENGL 123 counts towards the introductory rather than towards the creative writing limit.

Library requirement 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 of the two-term senior requirement for the major.

Credit/D/Fail Courses taken Credit/D/Fail may be counted toward the requirements of the major.

THE WRITING CONCENTRATION

The 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 writing concentration provides a structure for creative work and a community of support that many writers find rewarding. The 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 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 writing concentration must fulfill the same requirements as all English majors, except that they count four creative writing courses toward the major, including ENGL 489, 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 creative writing courses numbered 451 or higher, with at least one of these courses in the genre in which they plan to complete ENGL 489 (i.e., poetry, fiction, nonfiction, or drama) and (2) one course in another genre, which may include a creative writing course numbered 131 or higher. 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 130 or below count as literature courses. Residential College Seminars are not acceptable for credit toward the writing concentration, except by permission of the DUS. The 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 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; (4) a senior seminar or one-term senior essay and the senior project in the writing concentration. Students who wish to complete the senior requirement by the end of the fall term of the senior year may begin it in the spring of the junior year. 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 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 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 490 and 491 for procedures. Students fulfilling the senior requirement through a two-term senior essay or through a senior essay and the senior 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 for advice about their course choices. A list of departmental representatives is available on the department website.

In the fall of the junior year, each English major formally chooses 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. Schedules may be submitted to the residential college dean's office only after approval.

Individual programs of study In exceptional cases, a student whose interests and aims are well defined may, in consultation with the DUS, work out a program of study departing from the usual requirements of the major. Such a program must, however, meet the stated general criteria of range and coherence. For interdepartmental programs that include courses covering English literature, see Comparative Literature; Directed

Studies; American Studies; African American Studies; Ethnicity, Race, and Migration; Theater 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 ordinarily required for admission to graduate study, and that a course orienting them to critical theory can be especially helpful preparation.

Roadmap See visual roadmap of the requirements.

REQUIREMENTS OF THE MAJOR

Number of courses *Standard major*—14 courses (incl senior req); *Writing concentration*—15 courses (incl senior req)

Distribution of courses 3 courses chosen from ENGL 125, 126, 127, and 128; 1 adv course (numbered 131 or higher) in each of four historical periods as specified; 1 junior seminar; up to 5 courses numbered ENGL 130 or below; up to 2 creative writing courses; *Writing concentration*—same, except 4 creative writing courses including at least 2 numbered 451 or higher, one in same genre as ENGL 489; and 1 in another genre, numbered 131 or higher; at least 11 literature courses

Substitutions permitted DRST 001 and 002 or ENGL 129 and 130 or 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; all substitutions require DUS permission

Senior requirement *Standard major*—2 senior sems, or 1 senior sem and 1 senior essay (ENGL 490), or a two-term senior essay (ENGL 490, 491); *Writing concentration*—senior sem or senior essay, and ENGL 489. 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, Leslie Brisman, David Bromwich, Ardis Butterfield, Jill Campbell, Joe Cleary, Anne Fadiman (*Adjunct*), Louise Glück (*Adjunct*), Jacqueline Goldsby, Langdon Hammer, Margaret Homans, David Scott Kastan, Jonathan Kramnick, Lawrence Manley, Donald Margulies (*Adjunct*), Stefanie Markovits, Stephanie Newell, John Durham Peters, Caryl Phillips, David Quint, Marc Robinson, Caleb Smith, Katie Trumpener, Shane Vogel, Michael Warner, Ruth Yeazell

Associate Professors Marta Figlerowicz, Catherine Nicholson, Emily Thornbury, R. John Williams

Assistant Professors Anastasia Eccles, Ben Glaser, Alanna Hickey, Jonathan Howard, Cajetan Iheka, Elleza Kelley, Naomi Levine, Ernest Mitchell, Priyasha Mukhopadhyay, Joseph North, Jill Richards, Sunny Xiang

Senior Lecturers James Berger, Michael Cunningham, Richard Deming, Meghan O'Rourke, Cynthia Zarin

Lecturers Felisa Baynes-Ross, Steven Brill, Alan Burdick, Lincoln Caplan, Maximillian Chaoulideer, Danielle Chapman, Susan Choi, Alison Coleman, David de Leon, Margaret Deli, Clio Doyle, Andrew Ehrgood, Craig Eklund, Greg Ellermann, Randi Epstein, Paul Franz, Amity Gage, Lindsay Gellman, Rona Johnston Gordon, Derek

Greene, Jacob Halpern, Rosemary Jones, Heather Klemann, Verlyn Klinkenborg, Timothy Kreiner, Sarah Mahurin, Pamela Newton, Mark Oppenheimer, Stephanie Rannks, Barbara Riley, Timothy Robinson, Karin Roffman, Pamela Schirmeister, Madeleine Saraceni, Adam Sexton, Kim Shirkhani, Emily Skillings, R. Clifton Spargo, Margaret Spillane, Michele Stepto, Sarah Stillman, Barbara Stuart, James Surowiecki, Rasheed Tazudeen, Aaron Tracy, Emily Ulrich, Ryan Wepler, Christian Wiman, Bob Woodward

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, Sociology, and Study of the City. 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: John Fortner (john.fortner@yale.edu), 521 17 Hillhouse Ave.; 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.

PREREQUISITES

B.A. degree program in Engineering Sciences (Environmental) The B.A. degree program requires MATH 112 and 115; a two-term lecture sequence in chemistry; and PHYS 170, 171.

B.S. degree program in Environmental Engineering The B.S. degree program has the following prerequisites in mathematics and basic sciences: MATH 112, 115; MATH 120 or ENAS 151; ENAS 194; a two-term lecture sequence in chemistry, with corresponding labs; PHYS 180, 181; and BIOL 101 and 102 or BIOL 103 and 104.

REQUIREMENTS OF THE MAJOR

B.A. degree program The B.A. degree program requires nine term courses beyond the prerequisites, including the senior requirement. Students take ENVE 120, 360, and either ENVE 373 or 377. Five electives must be chosen in consultation with the director of undergraduate studies (DUS).

B.S. degree program The B.S. degree program requires at least twelve term courses beyond the prerequisites, including the senior requirement. Students take CENG 300

or MENG 211; ENVE 120, 360, 373, 377; ENVE 315 or 448; EVST 444 or ENVE 438; and MENG 361 or ENAS 646. At least three technical electives must be chosen in consultation with the DUS.

Credit/D/Fail No course taken Credit/D/Fail may count toward the major, including prerequisites.

SENIOR REQUIREMENT

B.A. degree program Students in the B.A. program must pass ENVE 416 or ENVE 490 in their senior year.

B.S. degree program Students in the B.S. program must pass ENVE 416 or ENVE 490 in their senior year.

REQUIREMENTS OF THE MAJOR

ENGINEERING SCIENCES (ENVIRONMENTAL), B.A.

Prerequisites MATH 112, 115; two-term lecture sequence in chemistry; PHYS 170, 171

Number of courses 9 term courses beyond prereqs (incl senior req)

Specific courses required ENVE 120, 360; ENVE 373 or 377

Distribution of courses 5 electives approved by DUS

Senior requirement ENVE 416 or ENVE 490

ENVIRONMENTAL ENGINEERING, B.S.

Prerequisites MATH 112, 115; MATH 120 or ENAS 151; ENAS 194; two-term lecture sequence in chemistry, with labs; PHYS 180, 181; BIOL 101 and 102 or BIOL 103 and 104

Number of courses 12 term courses beyond prereqs (incl senior req)

Specific courses required CENG 300 or MENG 211; ENVE 120, 360, 373, 377; ENVE 315 or 448; EVST 444 or ENVE 438, and MENG 361 or ENAS 646

Distribution of courses 3 technical electives approved by DUS

Senior requirement ENVE 416 or ENVE 490

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

Director of undergraduate studies: Michael Fotos (michael.fotos@yale.edu), Rm. 107, 115 Prospect St., 436-5190; 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 director 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 encourages students to focus in the natural sciences, especially fields such as environmental health and medicine, ecology, and energy and climate change. Both degree programs culminate in a senior essay project that is commonly preceded by independent summer research.

PREREQUISITES

The B.A. degree program has no prerequisites.

The B.S. degree program requires a natural science laboratory or field course focusing on research and analytic methods, and a term course in mathematics, physics, or statistics selected from MATH 112 or higher (excluding MATH 190), or PHYS 170 or higher, or S&DS 101 or higher; two-term lecture sequence in chemistry (or CHEM 170 or CHEM 167), and either the two-term biology introductory sequence BIOL 101, 102, 103 and 104, or EPS 125.

Students 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 that students complete the prerequisites by the end of their sophomore year, although this is not required.

REQUIREMENTS OF THE MAJOR

B.A. degree program The B.A. degree requires at least thirteen 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 101 or higher, or MATH 112 or higher; two core courses in the social sciences or humanities and three core courses in the natural sciences. Students may select core courses from among the list of approved core courses posted on the environmental

studies website. Completing one course in each core area is recommended before the end of the sophomore year.

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. Completing one course in each area is recommended before the end of the sophomore year.

Areas of concentration Students plan their concentration in consultation with the DUS and the student's adviser. 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 (200 level or higher) that exposes students to primary literature, extensive writing requirements, and experience with research methods. For the B.S. degree, three of the six courses must have the science (SC) designation, and two must provide interdisciplinary context to the concentration. 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 have the opportunity to design a unique concentration within the major, in consultation with the DUS.

Credit/D/Fail No course taken Credit/D/Fail may be counted toward the major, including prerequisites.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

In the junior year, all students consult with their advisers on the design of their project and submit a preliminary plan to the DUS for approval.

B.A. degree program For the B.A. degree, students most often complete one term of EVST 496, 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.

B.S. degree program For the B.S. degree, students complete two terms of EVST 496.

ADVISING

Effective for the Class of 2022, an application is no longer necessary to major in Environmental Studies.

Summer Environmental Fellowship During the spring term, EVST majors may apply for the Summer Environmental Fellowship 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. Although the summer program is optional, many students take advantage of this opportunity with some financial support from the program.

REQUIREMENTS OF THE MAJOR

Prerequisites *B.A.* – no prerequisites; *B.S.* – one natural science lab or field course focusing on research and analytic methods; one stat, math, or physics course from MATH 112 or higher (excluding MATH 190), or PHYS 170 or higher, or S&DS 101 or higher; two-term lecture sequence in Chemistry, or CHEM 170 or 167; and either the two-term Biology introductory sequence BIOL 101, 102, 103 and 104, or EPS 125

Number of courses *B.A.* – at least 13 course credits, incl senior project; *B.S.* – at least 12 course credits, beyond prereqs and incl senior project

Specific courses required *B.A.* – 6 core courses, as specified; *B.S.* – 2 core courses in humanities and social sciences and 2 core courses in natural sciences, as specified

Distribution of courses *B.A.* – 6 courses in area of concentration, including 1 advanced sem as specified; *B.S.* – 6 courses in area of concentration, 3 of which must have SC designation, and 2 must provide interdisciplinary context as specified

Senior requirement *B.A.* – one term senior essay and an advanced 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

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*), Graeme Berlyn (*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 & Biochemistry*), Susan Clark (*School of the Environment, Adjunct*), Deborah Coen (*History*), Michael Donoghue (*Ecology & Evolutionary Biology, School of the Environment*), Michael Dove (*School of the Environment, Anthropology*), Keller Easterling (*Architecture*), Menachem Elimelech (*Chemical & Environmental Engineering*), Daniel Esty (*School of the Environment*), 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*), 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 & Evolutionary Biology*), Jeffrey Powell (*Ecology & Evolutionary Biology, School of the Environment*), Daniel Prober (*Physics, Physics & Electrical Engineering*), Peter Raymond (*School of the Environment*), Susan Rose-Ackerman (*Law*), Paul Sabin (*History*), James Saiers (*School of the Environment*), Oswald Schmitz (*School of the Environment, Ecology & Evolutionary Biology*), James Scott (*Political Science, Anthropology*), Karen Seto (*School of the Environment*), Kalyanakrishnan Sivaramakrishnan (*Anthropology, School of the Environment*), David Skelly (*School of the Environment, Ecology & Evolutionary Biology*), Brian Skinner (*Earth and Planetary Sciences*), Ronald Smith (*Earth and Planetary Sciences, School of the Environment*), Stephen Stearns (*Ecology & Evolutionary Biology*), Peter Swenson (*Political Science, Institution for Social and Policy Studies*), Dorceta Taylor (*School of the Environment*), Charles Tomlin (*School of the Environment*) (*Visiting*), Gerald Torres (*School of the Environment, Law*), John Wargo (*School of the Environment, Political Science*), John

Warner (*History of Medicine, American Studies, History*), Michael Warner (*English, American Studies*), Harvey Weiss (*Near Eastern Languages & Civilizations, Anthropology*), Robert Wyman (*Molecular, Cellular, & Developmental Biology*), Carl Zimmer (*Molecular Biophysics and Biochemistry, Adjunct*) Julie Zimmerman (*Chemical & 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*), Elihu Rubin (*Architecture*), Carla Staver (*Ecology and Evolutionary Biology*), David Vasseur (*Ecology & 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, Ian Cheney, 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: Peter Swenson (peter.swenson@yale.edu), 115 Prospect St., 432-5677; epe.yale.edu

In an era of global interdependence and rapid technological change, we need to think practically about the institutional dynamics of power and governance. We have to understand the technical complexities of economic and statistical analysis at the same time that we think critically about basic moral and political choices. Constructive responses to such problems as coping with natural and social hazards, allocation of limited social resources (e.g., medical care), or morally sensitive political issues (e.g., affirmative action and war crimes) require close knowledge of their political, economic, and social dimensions, and a capacity to think rigorously about the basic questions they raise.

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.

PREREQUISITES

Students in the Class of 2023 and previous classes may register for the major upon completion of six out of the eight prerequisites by submitting their academic record to the EPE registrar.

Students in the Class of 2024 and subsequent classes may register for the major upon completion of eight prerequisites by their fifth term of enrollment. Students should submit their academic record to the EPE registrar.

Courses prerequisite to registering as an Ethics, Politics, and Economics major include one course from each of the following categories:

1. An Ethics course, either PHIL 175 or Directed Studies*
2. A course in other perspectives, from the following departments: Anthropology; Ethnicity, Race, and Migration; History; Sociology; Women's, Gender, and Sexuality Studies; or Directed Studies*
3. Political Philosophy, choosing from PHIL 178, PLSC 114, PLSC 118, or Directed Studies*

*Students completing two terms of Directed Studies fulfill the first three prerequisite requirements.

4. A Political Science introductory course in one of the following Political Science department's fields: international relations, comparative politics, and American government (not in the Political Science fields of political philosophy or analytical political theory)

5. ECON 110 or ECON 115

6. ECON 111 or ECON 116

7. Econometrics, one of ECON 117, 123, 135, GLBL 121, S&DS 230, or S&DS 238

8. Game Theory, one of EP&E 220, 231, 295, 297, or ECON 159

REQUIREMENTS OF THE MAJOR

Students in the Class of 2023 and previous classes With the approval of the director of undergraduate studies (DUS), the following changes to the requirements of the major may be fulfilled by students who declared their major under previous requirements.

Students in the Class of 2024 and subsequent classes must take fifteen term courses, including 3 core courses in two of three core areas, one of which must be EP&E 215; three concentration area courses which comprise a student's individual area of concentration; and ECON 121 or 125. The concentration is developed in consultation with the DUS and should culminate in a senior essay written in the area defined by the concentration.

Core courses The major requires that students take three core courses, EP&E 215, and two additional core courses from the major's three core areas, 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 DUS can offer guidance regarding appropriate courses to fulfill this requirement.

The *Ethics* core draws from courses on normative thinking from philosophy and political science (theory only), or from EP&E courses with Philosophy or Political Science listed as secondary departments.

The *Politics* core includes courses offered by Political Science as the primary department, or EP&E courses with Political Science listed as the secondary department.

The *Economics* core comprises courses offered by Economics as the primary department, or Political Science courses cross-listed with Economics.

Areas of concentration Each student defines an area of concentration in consultation with the DUS. 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. Students should not only recognize the accomplishments of varied interdisciplinary efforts, but also attempt to represent and in some cases further develop those accomplishments in their own work.

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. Areas of concentration must consist of three courses appropriate to the theme, plus the seminar or independent study course in which the senior essay is written (see "Senior Requirement" below). In designing the area of concentration, students are encouraged to include seminars from other departments and programs. The DUS will also require students to show adequate competence in 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 concentration more precisely.

Credit/D/Fail Students admitted to the major may take one of their Ethics, Politics, and Economics courses Credit/D/Fail. Such courses count as non-A grades in calculations for Distinction in the Major.

SENIOR REQUIREMENT

A senior essay is required for the major and should constitute an intellectual culmination of the student's work in Ethics, Politics, and Economics. The essay should fall within the student's area of concentration and may be written within a relevant seminar, with the consent of the instructor and approval of the DUS. If no appropriate seminar is offered in which the essay might be written, the student may instead enroll in EP&E 491 with approval of the DUS and a faculty member who will supervise the essay. Students who wish to undertake a more substantial yearlong essay may enroll in EP&E 492, 493.

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 late November. 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.

ADVISING

Graduate work Some graduate and professional school courses are open to qualified undergraduates and may be of interest to EP&E majors (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. Note that not all professional school courses yield a full course credit in Yale College. See Academic Regulations, section K, Special Arrangements, “Courses in the Yale Graduate and Professional Schools.”

Roadmap See visual roadmap of the requirements.

REQUIREMENTS OF THE MAJOR

Prerequisites 8 introductory courses as indicated

Number of courses 15 (incl prereqs and senior req)

Specific courses required EP&E 215; ECON 121 or ECON 125

Distribution of courses 3 core courses in 2 of 3 core areas (incl EP&E 215 and 1 adv sem); 3 courses and 1 senior req course in area of concentration defined by student in consultation with DUS

Senior requirement Senior essay in area of concentration (in an adv sem or in EP&E 491 or in EP&E 492 and 493)

FACULTY ASSOCIATED WITH THE PROGRAM OF ETHICS, POLITICS,
AND ECONOMICS

Professors Seyla Benhabib (*Political Science, Philosophy*), Dirk Bergemann (*Economics*), Donald Brown (*Economics*), David Cameron (*Political Science*), Stephen Darwall (*Philosophy*), Ron Eyerman (*Sociology*), Bryan Garsten (*Political Science*), Jacob Hacker (*Political Science*), Shelly Kagan (*Philosophy*), Joseph LaPalombara (*Emeritus*) (*Political Science*), Giovanni Maggi (*Economics*), William Nordhaus (*Economics*), Thomas Pogge (*Philosophy*), Douglas Rae (*Political Science*), John Roemer (*Political Science*), Susan Rose-Ackerman (*Political Science, Law School*), Frances Rosenbluth (*Director*) (*Political Science*), Ian Shapiro (*Political Science*), Jason Stanley (*Philosophy*), Peter Swenson (*Political Science*), Steven Wilkinson (*Political Science*)

Senior Lecturer Boris Kapustin (*Political Science*)

Lecturers Elaine Dezenski (*Global Studies*), Michael Fotos (*Political Science*), Karen Goodrow (*Political Science*), Stephen Latham (*Political Science*)

Ethnicity, Race, and Migration

Director of undergraduate studies: Zareena Grewal (zareena.grewal@yale.edu), 108 WLH, 436-8168, erm.yale.edu

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

Students must complete twelve term courses in Ethnicity, Race, and Migration, including the senior requirement. These twelve normally include ER&M 200, 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 300, 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.

Area of concentration In consultation with the director of undergraduate studies (DUS), each student defines an area of concentration consisting of six term courses, one of which must be a methods course; these concentration courses do not include the senior essay or project. Advanced work in a language related to a student's area of concentration is advised.

Credit/D/Fail No more than two courses taken Credit/D/Fail may be counted toward the major with permission of the DUS.

Roadmap See visual roadmap of the requirements.

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 491) 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 492) 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 30–35 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 prior to 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 the offerings of other departments in both 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 concentration 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific courses required ER&M 200, ER&M 300

Distribution of courses 6 courses in the area of concentration, 1 of which must be a methods course; 2 additional courses with ER&M content and DUS approval

Senior requirement Senior colloq (ER&M 491) and senior essay or project (ER&M 492); 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*), Hazel Carby (*African American Studies, American Studies*), Alicia Schmidt Camacho (*Ethnicity, Race, and Migration, American Studies*), Michael Denning (*American Studies, English*), Inderpal Grewal (*American Studies, Women's, Gender, & Sexuality Studies*), Matthew Jacobson (*American Studies, African American Studies, History*), Gilbert Joseph (*History*), Grace Kao (*Sociology*), Mary Lui (*American Studies, History*), Stephen Pitti (*History, American Studies*), Ana Ramos-Zayas (*American Studies, Ethnicity, Race, and Migration, Women's, Gender, & Sexuality Studies*)

Associate Professors Zareena Grewal (*American Studies*), Daniel Martínez HoSang (*American Studies, Ethnicity, Race, and Migration*), Daniel Magaziner (*History*)

Assistant Professors Albert Laguna (*American Studies, Ethnicity, Race, and Migration*), Sunny Xiang (*English*)

Lecturers Aaron Carico (*American Studies, African American Studies*), Leah Mirakhor (*American Studies, Ethnicity, Race, and Migration*), Joanna Radin (*History of Science & Medicine, History, Anthropology, American Studies, Ethnicity, Race, and Migration*), David Simon (*Political Science*), Quan Tran (*American Studies, Ethnicity, Race, and Migration*)

Visiting Lecturer Gary Okihiro

Film and Media Studies

Director of undergraduate studies: John MacKay; HQ, Room 128, 320 York St.; film and media studies

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.

PREREQUISITE

Students normally take FILM 150 in their first or second year. This course is useful preparation, and in some cases a prerequisite for other courses in the major.

REQUIREMENTS OF THE MAJOR

The Film and Media Studies major consists of twelve term courses, including the prerequisite and the senior requirement. Students are required to take FILM 160 and FILM 320, 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 (World Cinema, Critical Studies) in Yale Course Search. Students also must take at least one course on the creative process in film, designated by the attribute 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 will ensure 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 counted toward the major with permission of the DUS.

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.

Majors graduating in December must submit their senior essays or senior projects to the DUS by Friday, December 10, 2021; those graduating in May, by Friday, April 29, 2022. 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 161, 162 by the end of their sophomore year, and continue with FILM 355, 356 by the end of their junior year, to prepare for FILM 455, 456 or 483, 484 in their senior year. Those students interested in screenwriting often begin with FILM 350. 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 487, 488) 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 483, 484) or the Documentary Film Workshop (FILM 455, 456), and receive three credits for their projects (two credits for FILM 483, 484 or 455, 456, and one for FILM 493 or 494). Such a choice effectively commits students to one extra course in addition to the twelve courses required for the major, because FILM 493 or 494 does not count toward the twelve required courses when taken in conjunction with FILM 483, 484 or 455, 456. 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 493 and 494 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 400s) 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 491, 492). 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 491 or 492), 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.

REQUIREMENTS OF THE MAJOR

Prerequisite FILM 150

Number of courses 12 term courses (incl prereq and senior req)

Specific courses required FILM 160 and FILM 320

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 491, 492), or 1 term of each; for *senior project*—2 terms of senior project in FILM 455, 456, or 483, 484, and either FILM 493 or 494, for a total of 13 term courses; or 2 terms of senior project in FILM 487, 488; or 2 terms of senior project in FILM 493, 494 *with approved petition*

Intensive major Both senior project in production and senior essay

FACULTY ASSOCIATED WITH THE PROGRAM OF FILM AND MEDIA STUDIES

Professors *Dudley Andrew (*Comparative Literature, Film & Media Studies*), *Francesco Casetti (*Humanities, Film & Media Studies*), *Katerina Clark (*Comparative Literature, Slavic Languages & Literatures*), *Aaron Gerow (*East Asian Languages & Literatures, Film & Media Studies*), *John MacKay (*Film & Media Studies, Slavic Languages & Literatures*), *Millicent Marcus (*Italian*), Kobena Mercer (*History of Art, African American Studies*), *Charles Musser (*American Studies, Film & Media Studies*), Fatima Naqvi (*German*), *John Durham Peters (*English, Film & Media Studies*), *Katie Trumpener (*Comparative*

Literature, English), Laura Wexler (*American Studies, Women's, Gender, & Sexuality Studies*)

Associate Professors Marta Figlerowicz (*Comparative Literature, English*), Moira Fradinger (*Comparative Literature*), Zareena Grewal (*Ethnicity, Race, & Migration*), Brian Kane (*Music*), *R. John Williams (*English*)

Assistant Professor Marijeta Bozovic (*Slavic Languages & Literatures, Film & Media Studies, Women's Gender & Sexuality Studies*)

Senior Lecturer Marc Lapadula (*Film & Media Studies*)

Lecturers Jonathan Andrews (*Art, Film & Media Studies*), James Charney (*School of Medicine*), Oksana Chefranova (*Film & Media Studies*), Nicholas Forester (*Film & Media Studies*), Thomas Allen Harris (*African American Studies, Film & Media Studies*), Camille Thomasson (*Film & Media Studies*)

Senior Lectors Krystyna Illakowicz (*Slavic Languages & Literatures*), Karen von Kunes (*Slavic Languages & Literatures*)

*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. Students must apply for First-Year Seminars before the beginning of each term. To ensure that all applicants share an equal chance at enrolling in a seminar, students are admitted by lottery from among those who apply. Students who do not apply may be considered for placement at the instructor's discretion if space is available. Information regarding application procedures may be found on the program website.

French

Director of undergraduate studies: Thomas C. Connolly
(thomas.c.connolly@yale.edu), 320 York St., Rm. 385; Language program director:
Ruth Koizim (ruth.koizim@yale.edu), 320 York St., Rm. 378; 203-432-4904;
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 one of the world's richest 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, politics, 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 foreign language and a mature, informed appreciation of a foreign literature open doors to many professions. The French major provides ideal preparation for careers in a wide range of fields from law and diplomacy to journalism, teaching, academia, and the arts. Recent graduates have gone on to selective law 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). Appropriate majors to combine with French might include, but are not limited to, African American Studies, African Studies, English, Film and Media Studies, Global Affairs, History, History of Art, Humanities, Comparative Literature, Music, Philosophy, Political Science, Theater and Performance Studies, and Women's, Gender, and Sexuality Studies. Regulations concerning the completion of two majors can be found in the Academic Regulations, section K, Special Arrangements.

COURSE NUMBERING

Group A courses (FREN 110–159) This group consists of language courses that lead directly to courses counting toward the major. Preregistration is required for all Group A courses except FREN 125 and 145. FREN 121 (the stand-alone 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 Ruth Koizim (ruth.koizim@yale.edu), the language program director. (ruth.koizim@yale.edu)

Group B courses (FREN 160–449, not including Group C courses) This group contains more advanced courses that are taught in French and count toward the major. FREN 160 and 170 are gateway courses that prepare students for courses numbered FREN 200 and above. Courses in the FREN 180–199 range are advanced language courses. Courses numbered 200–449 are advanced courses in literature and

culture. The 200–299 range contains courses devoted to broad, general fields defined by century or genre; the 300–449 range contains courses devoted to specific topics within or across those general fields.

Group C courses This group comprises courses taught in English; readings may be in French or English. Two term courses from this group may be counted for credit toward the major.

PREREQUISITES

Candidates for the major should take FREN 150 or the equivalent during the first or second year. Prospective majors are strongly encouraged to take at least one literature course numbered 170 or above before the end of the sophomore year.

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.

All students who have not yet studied French at Yale (except those who have had no previous exposure to French whatsoever) are expected to take the departmental placement exam. Students who studied abroad over the summer with non-Yale programs must take the placement exam to be eligible to receive credit for their work.

Students who earned superior scores on standardized tests may be able to enroll in a course designated L5. The department strongly recommends, however, that advanced students of French take the departmental placement exam in order 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 150 level and above.

REQUIREMENTS OF THE MAJOR

The standard major The standard major consists of ten term courses numbered 160 or above, including a one-term senior essay (see below). One of these ten courses must be FREN 170 or the equivalent, which should be completed early in a candidate's studies; at least four must be Group B courses numbered 200 or above. Students may count no more than two courses in the FREN 180–199 range and no more than two courses conducted in English (Group C) 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.

Translation track Students may elect to pursue the translation track within the French major. Translation track 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 twelve

credits required for the intensive major. Within the department, this requirement can be fulfilled by taking FREN 191 and FREN 192. Students who opt for the translation track may take up to four courses numbered 180–199, rather than the standard two courses.

The intensive major The intensive major is designed for students who wish to undertake a more concentrated study of literature in French. It is recommended for students considering graduate study in French or in comparative literature. The intensive major consists of twelve term courses numbered 160 or above, including a one-term or two-term senior essay (see below). At least five courses must be from Group B and numbered 200 or above. The requirement of FREN 170 and the stipulations for courses in the 180–199 range, courses conducted in English, and courses taken outside the department are identical to those for the standard major.

Credit/D/Fail One required course taken Credit/D/Fail may be counted toward the major (excluding the senior requirement).

SENIOR REQUIREMENT

All majors must write a senior essay showing evidence of careful reading and 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 491 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 16, 2021 (fall-term essay), or November 5, 2021 (spring-term essay). A one-page prospectus and bibliography are due September 17, 2021 (fall term), or January 21, 2022 (spring term). A rough draft must be submitted to the adviser by October 29, 2021 (fall term), or March 25, 2022 (spring term). Two copies of the final essay are due in the department by December 1, 2021 (fall term), or April 18, 2022 (spring term).

Students electing a two-term essay for the intensive major must select their subject and adviser by the end of the junior year and enroll in FREN 493 and 494 during the senior year. The essay should be approximately 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 1, 2021. A one-page prospectus and bibliography are due September 17, 2021. Students must submit an initial rough draft to their adviser by January 21, 2022, and a complete draft by March 25, 2022. Two copies of the final essay are due in the department by April 18, 2022.

In place of the thirty-page senior essay for the standard major or the sixty-page senior essay for the intensive major, translation track majors undertake a literary translation of similar length to the senior essay, working with a member of the French Department ladder faculty. The senior translation essay, FREN 492 or 495 and 496, 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 the one-term essay and the two-term essay apply to the translation track essay. Standard major translation track students should sign up for FREN 492, and intensive major translation track students

should sign up for FREN 495 and 496 for the fall and spring, respectively. Materials submitted for the translation essay cannot be the same as the materials submitted for any translation courses. Do not hesitate to contact the DUS if you have questions about this rule.

ADVISING

Students in the major are encouraged to take as many advanced courses as possible in all historical periods from the Middle Ages to the present. Candidates for the major should consult the DUS as early as the beginning of the sophomore year and no later than the fall term of the junior year. Schedules must be approved and signed by the DUS. 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 subjects elected from other departments. Close consultation with departmental advisers is required; candidates for a Special Divisional Major should consult the DUS in French by the fall term of the junior year. For further information, see Special Divisional Majors.

STUDY ABROAD

Students are encouraged to spend a term or a year abroad, for which appropriate course credit is granted. Summer study abroad may also, in some cases, receive course credit. Further information may be obtained from the Center for International and Professional Experience and from (ruth.koizim@yale.edu) Ruth Koizim (ruth.koizim@yale.edu), the study abroad adviser for the Department of French.

REQUIREMENTS OF THE MAJOR

Prerequisite FREN 150 or equivalent

Number of courses *Standard major and translation track*—10 term courses numbered 160 or above (incl senior req); *Intensive major*—12 term courses numbered 160 or above (incl senior req)

Specific course required FREN 170 or equivalent

Distribution of courses *Standard major*—at least 4 courses in Group B numbered 200 or above; no more than 2 courses numbered FREN 180–199; no more than 2 courses conducted in English; *Translation track*—same as standard, except min of 2 translation courses and no more than 4 courses numbered FREN 180–199; *Intensive major*—same as standard, plus 1 addtl Group B course numbered 200 or above

Substitution permitted With prior approval of DUS, up to 4 term courses outside French dept, as specified

Senior requirement *Standard major* – one-term senior essay in French or English (FREN 491); *Translation track* – one-term literary translation essay (FREN 492); *Intensive major* – one-term (FREN 491) or two-term senior essay in French or English (FREN 493, 494); *Translation track, Intensive major* – two-term literary translation essay (FREN 495, 496)

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The French Department offers a Certificate of Advanced Language Study. 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 student transcripts. Once you have fulfilled the requirements indicated below, email (morgane.cadieu@yale.edu) Thomas C. Connolly (thomas.c.connolly@yale.edu) (DUS) and Bethany Hayes (bethany.hayes@yale.edu) (Registrar) and include a copy of your academic record.

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. Additionally the French department requires that a minimum of one of the four required courses be a French department course listed at the 200 level or above. 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 or a graduate seminar 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 those courses appear on their transcript.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

FACULTY OF THE DEPARTMENT OF FRENCH

Professors R. Howard Bloch, Dominique Brancher (*Visiting*), Marie-Hélène Girard (*Visiting*), Alice Kaplan, Pierre Saint-Amand, Maurice Samuels

Associate Professors Morgane Cadieu, Thomas C. Connolly

Assistant Professors Jill Jarvis, Christophe Schuwey

Senior Lecturers Lauren Pinzka, Maryam Sanjabi, Alyson Waters

Senior Lectors Kathleen Burton, Ruth Koizim, Soumia Koundi, Matuku Ngame, Françoise Schneider, Constance Sherak, Candace Skorupa, Vanessa Vysosias

Lector Leo Tertrain

German Studies

Director of undergraduate studies: Paul North (paul.a.north@yale.edu), 120 York Street Room 356, 432-0782; language program director: Theresa Schenker (theresa.schenker@yale.edu), 120 York Street Room 354, 432-6401; german.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 NUMBERING

Group A courses Courses in Group A (GMAN 110–159) correspond to Yale's L1 to L5 designation of elementary, intermediate, and advanced language courses.

Group B courses Courses in Group B (GMAN 160-level and 170-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 200) 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 will be accessible July 1 through August 15, 2021. See the department website for details. Students wishing to take the placement exam in January should sign up with the language director by December 1, 2021. Students may also consult with the director of undergraduate studies (DUS) or the language 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 110 or 125.

REQUIREMENTS OF THE MAJOR

The major in German Studies consists of ten term courses, including the senior essay. All majors must complete at least one GMAN course numbered in the 150s, one in the 160s, and one in the 170s, plus six additional courses—four in the area of concentration and two electives—from Groups B and C, numbered GMAN 160 and above. With permission of the DUS, some substitutions and exceptions may be possible.

Areas of concentration Each German Studies major selects an area of concentration from five choices: (1) literature, (2) media and media theory, (3) history and politics, (4) critical thought, and (5) aesthetics and the arts. The *literature* concentration gives students access to worlds of thought and action. Students learn to read critically poetry, novels, plays, short stories, aphorisms, songs, and other genres. Courses fulfilling the literature concentration include at least one course each in nineteenth- and twentieth-century literature. The concentration in *media and media theory* explores 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. The *history and politics* concentration focuses 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. The concentration in *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. The *aesthetics and the arts* concentration surveys 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 A maximum of two courses taken Credit/D/Fail may count toward the major, with permission of the DUS.

SENIOR REQUIREMENT

Seniors in the standard German Studies major enroll in GMAN 492, 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 September 8, 2021; a three-page prospectus and a bibliography are due by September 22. A rough draft must be submitted to the adviser by November 3. The completed essay, due on December 8, 2021, is judged by the faculty adviser and a second reader.

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 492 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 22, 2021. The student must submit a draft of at least fifteen pages of the essay by December 1, 2021, to receive credit for the first term of the course. The second term, GMAN 493, is devoted to completing the essay, which should be substantial (between fifty and sixty pages); the completed essay must be submitted by April 13, 2022. The senior essay is judged by the faculty adviser and a second reader.

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 Arrangements, “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.

REQUIREMENTS OF THE MAJOR

Prerequisites First- and second-year German or equivalent

Number of courses 10 (incl senior req)

Distribution of courses At least 1 GMAN course in the 150s, at least 1 in the 160s, and at least 1 in the 170s; 4 courses in area of concentration and 2 electives (numbered GMAN 160 and above) from Groups B and C; *Literature concentration* – at least 1 course each in 19th- and 20th-century literature

Substitution permitted With DUS approval, some substitutions and exceptions may be possible

Senior requirement Senior essay tutorial (GMAN 492)

Intensive major Two-term senior essay (GMAN 492 and 493)

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 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 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, a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one “language across the curriculum” (LxC) course, which ordinarily is an advanced seminar with an additional weekly discussion section in the target language, to count toward the certification requirements. 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.

FACULTY OF THE DEPARTMENT OF GERMANIC LANGUAGES AND LITERATURES

Professors Rüdiger Campe, Fatima Naqvi, Paul North, Brigitte Peucker, Kirk Wetters (*Chair*)

Assistant Professor Katrin Truedstedt

Senior Lectors II Marion Gehlker, Theresa Schenker

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: Sigga Benediktsdottir
(sigridur.benediktsdottir@yale.edu), 202 Horchow Hall, 432-3418; jackson.yale.edu/ba-degree

The Global Affairs major, administered by the Jackson Institute for Global Affairs, prepares Yale students for global citizenship and service by enhancing their understanding of the world around them. Students in this interdisciplinary major develop expertise in contemporary global affairs that is strongly grounded in the social sciences.

Students in the Global Affairs major have the flexibility to shape their own curriculums according to their interests and ambitions. In the past, students have concentrated their coursework on economic development and poverty, global health, global climate policy, international relations, 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 Institute website.

PREREQUISITES

There are no prerequisites for the Global Affairs major. However, students interested in applying to the major are strongly encouraged to complete the following required introductory economics sequence (ECON 108, 110, or 115; and ECON 111 or 116) and work toward the language requirement early in their course planning. An introductory analysis course, such as GLBL 121, ECON 117 or S&DS 100–106 is also suggested. These courses are all required for the major and progress towards completing them, at the time of application, will be considered.

REQUIREMENTS OF THE MAJOR

Thirteen term courses are required for the major in addition to a language requirement. Introductory courses in microeconomics (ECON 108, 110, or 115) and macroeconomics (ECON 111 or 116) are required, as is one intermediate course in either microeconomics or macroeconomics (ECON 121, 122, 125 or 126). All majors must take the core courses GLBL 225 and 275, and two courses in quantitative analysis, GLBL 121 and 122. GLBL 121 is recommended but can be replaced by other analysis courses including ECON 117 and S&DS 100–106, with approval of the director of undergraduate studies (DUS). Majors also take four electives and one methods course chosen from an approved group of courses in the departments of Global Affairs, History, Political Science, Economics, and other social science departments; and GLBL 499, Senior Capstone Project. For information about which courses qualify as electives, see the Jackson Institute website and the course listings in Yale Course Search.

Language requirement Global Affairs majors are required to take a course designated L5 in a modern language other than English. In exceptional cases, a demonstration of proficiency can fulfill this requirement.

Credit/D/Fail Courses taken Credit/D/Fail may not be applied to the requirement—s of the major, with the exception that a grade of Credit in an L5 language course may be used to demonstrate proficiency in a foreign language.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

In the fall term of the senior year, majors must complete a capstone project in GLBL 499. Small groups of students are each assigned to a policy task force in which they apply their academic training in the social sciences to a specific problem relevant to global affairs. Each task force presents its findings and recommendations to a real-world client such as a government agency, a nongovernmental organization or nonprofit group, or a private-sector organization in the United States or abroad.

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 Institute website, circulated through the residential college deans' offices, and noted on the Advising Resources website. For application information, visit the Jackson Institute 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 Institute Career Services Office can help students find appropriate internships.

STUDY ABROAD

Global Affairs majors who plan to study abroad should consult the director of student affairs, Lily Sutton (lily.sutton@yale.edu), to devise a course of study prior to the term abroad.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 13 (incl senior req; excluding lang req)

Specific courses required ECON 108, 110, or 115; ECON 111 or 116; ECON 121 or 122; GLBL 225; GLBL 275; GLBL 121; GLBL 122

Distribution of courses 4 approved electives and 1 methods course

Language requirement Advanced ability (L5) in 1 modern lang other than English

Substitution permitted With DUS approval, GLBL 121 may be replaced by other analysis courses including ECON 117 and S&DS 100–106

Senior requirement Senior capstone project in GLBL 499

FACULTY ASSOCIATED WITH THE PROGRAM OF GLOBAL AFFAIRS

Professors David Engerman (*History*), John Gaddis (*History*), Jacob Hacker (*Political Science*), Oona Hathaway (*Law*), Amy Kapczynski (*Law, Global Health*), Paul Kennedy (*History*), Robert T. Jensen (*School of Management*), James Levinsohn (*Director*) (*School of Management*), A. Mushfiq Mobarak (*School of Management*), Samuel Moyn (*Law*), Catherine Panter-Brick (*Anthropology*), Peter Schott (*Economics, School of Management*), Ian Shapiro (*Political Science*), Timothy Snyder (*History*), Jing Tsu (*East Asian Languages and Literatures*), Aleh Tsyvinski (*Economics*), Odd Arne Westad

(*History*), Steven Wilkinson (*Political Science*), Ernesto Zedillo (*International Economics & Politics*)

Associate Professors Alexandre Debs (*Political Science*), Kaveh Khoshnood (*School of Public Health*), Jason Lyall (*Political Science*), Nuno Monteiro (*Political Science*), Marci Shore (*History*), Jonathan Wyrzten (*Sociology, International Affairs*)

Assistant Professors Lorenzo Caliendo (*Economics, School of Management*), Zack Cooper (*School of Public Health*), Gregg Gonsalves (*School of Public Health*), Lloyd Grieger (*Sociology*), Alice Miller (*School of Public Health, Law*), Thania Sanchez (*Political Science*), Kristina Talbert-Slagle (*School of Medicine, Global Health*)

Senior Lecturers Marnix Amand, Sigga Benediktsdottir, Charles Hill (*International Security Studies*), Asha Rangappa, Justin Thomas

Lecturers Michael Brenes, Christopher Fussell, William Casey King, Nicholas Lotito (*Political Science*), Alice Miller (*Public Health, Law*), Jaimie Morse, Nathaniel Raymond, Daniel Steinmetz-Jenkins, Edward Wittenstein

Senior Fellows Eric Braverman, David Brooks, Howard Dean, Janine di Giovanni, Robert Ford, Clare Lockhart, Stanley McChrystal, Rakesh Mohan, David Rank, Stephen Roach, Emma Sky

Global Health Studies

Program director: Catherine Panter-Brick; (catherine.panter-brick@yale.edu) Global Health Studies Program

GLOBAL HEALTH STUDIES MULTIDISCIPLINARY ACADEMIC PROGRAM

The Global Health Studies program provides interdisciplinary global health coursework for undergraduates at Yale, offering a program of study that draws upon the natural sciences, social sciences, and the humanities. The program challenges students to critically engage with the multifaceted dilemmas of contemporary global health, examining the roles of politics, history, and economics, as well as anthropology, ethics, law, and sociology, in conversation with public health and the medical sciences. Students choose a major in another department or program and expand their education with courses offered by Global Health Studies.

Students who apply to the program, typically in the fall of their sophomore year, become Global Health Scholars. They complete interdisciplinary coursework across six global health competency areas: Biological & Environmental Influences on Health; Health & Societies; Historical Approaches; Performance, Representation & Health; Political Economy & Governance in Health; Understanding & Interpreting 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 which meaningfully integrates the skills and knowledge acquired throughout the program.

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 K, Special 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.

REQUIREMENTS OF THE PROGRAM

Prerequisite None

Number of courses 6 courses (incl senior req)

Specific course required HLTH 230

Distribution of courses 4 electives to achieve the six global health competencies as indicated

Senior requirement HLTH 490, Senior colloquium

Hellenic Studies

Chair: John Geanakoplos (john.geanakoplos@yale.edu), 30 Hillhouse Ave., 432-3397; **Director:** George Syrimis (george.syrimis@yale.edu), 34 Hillhouse Ave., 432-9342; <http://hsp.macmillan.yale.edu>

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 postantiquity 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 postantiquity Greek language, society, or culture are advised to consult with the program director of the Hellenic Studies program.

FACULTY ASSOCIATED WITH THE PROGRAM OF HELLENIC STUDIES

Professor John Geanakoplos (*Economics*)

Lecturers Paris Aslanidis, George Syrimis

Senior Lector Maria Kaliambou

History

Director of undergraduate studies: Mark Peterson (mark.a.peterson@yale.edu), 190 York St., 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

Courses numbered HIST 001–099 are First-Year Seminars, with enrollment limited to eighteen. Remaining course numbers are organized by region, not by rigor or difficulty. Courses numbered in the 100s explore the history of the United States or Canada; those in the 200s, Europe, Russia, and Britain; and those in the 300s, Africa, Asia, Latin America, and the Middle East. Courses numbered in the 400s address global topics. Courses whose numbers end with the letter “J” are departmental seminars; all departmental seminars are available for preregistration by History majors and are capped at fifteen students.

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.

REQUIREMENTS OF THE MAJOR

Ten term courses in History are required, including prerequisites, and in addition to the senior essay.

Upon declaration, all History majors select either the global or the specialist track. The global track is designed for students seeking a broad understanding of major trends in the history of human societies throughout the world. The specialist track 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 tracks until the end of the course selection period in the second term of the junior year.

The global track requires one course in each of five different geographic regions (see below). Students must also take two preindustrial courses, covering material before the year 1800, and two departmental seminars, identified by a “J” suffix to the course number (such as HIST 138J).

The specialist track 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 course work must include at least three geographic regions. Like students in the global track, students in the specialist track must take two preindustrial courses, covering material before the year 1800, and at least two departmental seminars, identified by a "J" suffix to the course number (e.g. HIST 138J). Students in the specialist track may design an area of specialization with the approval of a faculty adviser and the director of undergraduate studies (DUS).

Regions: United States; Europe; Latin America; Asia; Middle East; and Africa.

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 track may count the same courses toward geographical, preindustrial, and seminar requirements. For instance, a departmental seminar on premodern Japan simultaneously fulfills the preindustrial, seminar, and Asia geographical requirements.

Departmental seminars All students who declare the History major are entitled to preregister for two departmental seminars (designated by a course number ending in J, such as HIST 138J). 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, and courses in other departments that count toward the History major do not fulfill the departmental seminar requirement.

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 Departmental seminars cannot be taken Credit/D/Fail.

Roadmap See visual roadmap of the requirements.

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 departmental essays by enrolling in HIST 497 during the fall of senior year. In rare circumstances, with permission of the adviser and senior essay director, a student enrolled in HIST 497 during the fall term may withdraw from the course in accordance with Yale College regulations on course withdrawal and enroll in HIST 497 during the spring term. Additional details about the senior essay are provided in the Senior Essay Handbook, available on the History website.

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 495 (first term of senior year) and HIST 496 (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 495 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 497 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.

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 track are assigned an adviser from the general History faculty. Students in the specialist track are assigned an adviser in their area of specialization. At the beginning of each term, students majoring in History must have their schedule signed and approved by their departmental adviser or by the DUS. Students may request a specific adviser in consultation with the DUS, though the department cannot always accommodate such requests.

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. Nondepartmental 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 K, Special 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.

REQUIREMENTS OF THE MAJOR

Prerequisites 2 term courses in History

Number of courses 10 term courses (incl prereqs, not incl senior essay)

Distribution of courses *Both tracks* – 2 courses in preindustrial hist as specified; 2 departmental sems; *Global track* – 1 course in each of 5 geographical regions (U.S., Europe, Latin America, Asia, Africa, Middle East); *Specialist track* – at least 5 courses in specific region or pathway; at least 2 courses outside region or pathway; overall course work must include 3 regions

Substitution permitted 1 or 2 nondepartmental courses approved by DUS

Senior requirement Two-term senior essay (HIST 495 and 496) or one-term senior essay (HIST 497)

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 Wrytzen

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: Edward Cooke (edward.cooke@yale.edu) [Spring 2021]; Jacqueline Jung (jacqueline.jung@yale.edu) [Fall 2021, Spring 2022]; 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

100-level courses are broad introductory surveys that address basic art history from a number of regional and thematic perspectives. Prospective majors are encouraged to take the surveys 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 place out of one required 100-level course.

Intermediate and advanced courses, numbered above 200, encompass more specialized surveys and themes in art history.

REQUIREMENTS OF THE MAJOR

Twelve term courses are required to complete the major: two introductory courses at the 100 level; four intermediate and advanced courses at the 200 and 300 levels; two seminars at the 400 level; a methods seminar, HSAR 401; two electives; and the senior essay, HSAR 499.

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 401, *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 Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

Roadmap See the visual roadmap of the requirements.

SENIOR REQUIREMENT

The senior essay is a research paper written usually in one term in HSAR 499. 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; 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific courses required HSAR 401

Distribution of courses 2 courses at 100 level; 6 courses numbered above 200, 2 of which must be 400-level seminars, fulfilling distribution requirements in 4 geographical and 4 chronological categories; 2 electives

Substitution permitted With DUS permission, 2 electives from related depts

Senior requirement Senior essay (HSAR 499)

FACULTY OF THE DEPARTMENT OF HISTORY OF ART

Professors Carol Armstrong, Tim Barringer, Edward S. Cooke, Jr., Milette Gaifman, Pamela Lee, Kobena Mercer, Kishwar Rizvi, Nicola Suthor, Mimi Yiengpruksawan

Associate Professors Marisa Bass, Craig Bradley, Molly Brunson (*Slavic Languages and Literatures*), Cecile Fromont, Jacqueline Jung, Jennifer Raab

Assistant Professors Joanna Fiduccia, Subhashini Kaligotla, Morgan Ng, Quincy Ngan

Lecturer Margaret Olin (*Religious Studies, Judaic Studies, Divinity*)

History of Science, Medicine, and Public Health

Director of undergraduate studies: Ivano Dal Prete (ivano.dalprete@yale.edu), EM 310; 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. For example, is science universal, or does each culture have its own approach to trustworthy knowledge? What is the relationship between medical expertise, social structure, 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 in the slave trade, 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

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 guides them through an area of specialization. The seven concentration courses must include two courses in History of Science, Medicine, and Public Health; one seminar numbered 100 or above 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.

Concentrations The five standard concentrations in the major are Medicine and Public Health; Global Health; Science, Technology, and Society; Gender, Reproduction, and the Body; and Media, Knowledge, and Visual Cultures. 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.

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 A maximum of one History of Science, Medicine, and Public Health course taken Credit/D/Fail before the fifth term of enrollment may be counted toward the requirements of the major.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

By the end of reading period in the spring term of the junior year, students choose whether they will work toward a yearlong or a one-term senior project. Yearlong senior projects are completed in HSHM 490, 491; one-term projects are completed in HSHM 492. Students who choose a one-term project must take an additional HSHM-listed course to complete the major. Only students who complete a yearlong senior project are eligible for Distinction in the Major.

For both the one-term and yearlong senior projects, 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 project is approved by the senior project director. Either the adviser or the second reader must be a member of the faculty in History of Science, Medicine, and Public Health. A written component to 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Distribution of courses 7 courses in concentration, incl 2 HSHM courses, 1 sem in HSHM or HIST numbered 100 or above, 1 science course, and 3 electives; 3 addtl HSHM electives, incl 1 sem and 1 course outside major concentration

Senior requirement Yearlong project (HSHM 490, 491), or one-term project (HSHM 492) and 1 addtl HSHM elective

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 Carolyn Roberts, Nana Quarshie

Lecturers Sakena Abedin, Ivano Dal Prete, Chitra Ramalingam, Miriam Rich

Affiliated Faculty Rene Almeling (*Sociology*), Toby Appel (*Yale University Library*), Melissa Grafe (*Yale University Library*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Ann Hanson (*Classics*), 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

Program director: James Silk (humanrights.program@yale.edu), L39 SLB, 432-1729; humanrights.yale.edu

HUMAN RIGHTS STUDIES MULTIDISCIPLINARY ACADEMIC PROGRAM

The Multidisciplinary Academic Program in Human Rights Studies presents human rights as a rich and interdisciplinary field of study. The program provides students with the analytical, conceptual, and practical skills necessary for human rights study; connects students to affiliate faculty and peers; supports student research projects and internships; and offers guidance for post-graduate careers and studies related to human rights. Students apply to the Multidisciplinary Academic Program in Human Rights Studies during the fall term of the sophomore year. Students in the program also complete the requirements of a Yale College major. Yale College does not offer a major in human rights.

To fulfill the requirements of the program, students complete a gateway course (HMRT 100), four electives, and a capstone seminar (HMRT 400), which entails completion of a final capstone project. The gateway course equips students with the theoretical tools necessary for studying human rights, their evolution, and their justification. It introduces a number of contemporary issues such as gender disparities, racial discrimination, climate change, global health, human trafficking, refugees, world poverty, and humanitarian intervention. Students select four electives from a list of eligible courses provided at the start of each term. In the capstone seminar, students explore selected advanced issues in international human rights law and advocacy and complete a supervised capstone project that is informed by extracurricular experience and developed in consultation with the program director and other program advisers. Students' capstone projects may draw on ideas and methods of a wide variety of disciplines.

Students are also expected to submit three reflections on Schell Center human rights events during the spring term of their sophomore year and one event reflection each term thereafter. They also attend program events and gatherings, including weekly dinners during the sophomore spring term and junior fall term. Additional information is available at the Human Rights program website.

REQUIREMENTS OF THE PROGRAM

Prerequisite None

Number of courses 6 courses (incl senior req)

Specific courses required HMRT 100

Other requirements 4 electives and event reflections as described

Senior requirement HMRT 400

ADVISORY COMMITTEE FOR THE MULTIDISCIPLINARY ACADEMIC PROGRAM IN HUMAN RIGHTS STUDIES

Amity Doolittle (*School of the Environment, Environmental Studies*), Crystal Feimster (*African American Studies, American Studies*), Moira Fradinger (*Comparative Literature*), Paul Linden-Retek (*Law School, Political Science*), Talya Lockman-Fine (*Law School*), Louisa Lombard (*Anthropology*), Hope Metcalf (*Law School*), Alice Miller (*Law School*),

Public Health), Samuel Moyn (*Law School, History*), Jill Richards (*English*), James Silk (*Law School*), David Simon (*Political Science*), Quan Tran (*Ethnicity, Race, and Migration, American Studies*), Elisabeth Wood (*Political Science*)

Humanities

Director of undergraduate studies: Paul Grimstad, (paul.grimstad@yale.edu) HQ, 320 York St., 432-7658; chair: Bryan Garsten (bryan.garsten@yale.edu), HQ, 320 York St.; humanities.yale.edu

The undergraduate program in Humanities provides students the opportunity to integrate courses from across the humanistic disciplines into intellectually coherent and 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 offers both interdisciplinary breadth and intellectual depth.

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 concentration 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

Fourteen term courses are required for the major, including three "foundational works" surveys, two core seminars, one course in each of four areas of study in the humanities (which may include the Franke and Shulman Seminars), four additional electives selected to complement the student's area of concentration 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.

Foundations Three broad surveys of foundational works in any cultural tradition are required, such as HIST 280, EALL 200, or RLST 189. One or two foundations courses must be in the classical tradition of Western Europe, such as Directed Studies, or ENGL 129 or CLCV 256.

Core seminars The major requires two core seminars, one in "Modernities" and one in "Interpretations." Core seminars typically are 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.

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 In an effort to spark integrative thinking across a student's various courses and extracurricular commitments, students are encouraged to log entries outlining particularly striking moments in their intellectual lives, whether in courses or outside of them, and are encouraged to keep track of questions they would like to pursue in their studies, insights they come across, and projects they envision for themselves in the future, including possible senior essay topics. Students must submit a minimum of one journal entry each semester to the DUS. At the completion of their studies, students will receive a hard copy of their journal.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

A one- or two-term senior essay is required (HUMS 491).

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 and the Shulman Seminar Sponsored by the Whitney Humanities Center and designed to speak across disciplinary lines to broad public and intellectual issues, the Franke Seminar and the Shulman Seminar each include a series of coordinated public lectures. The seminars are for enrolled students; the lecture series are open to the Yale and local communities. Humanities majors may enroll in a Franke or a Shulman Seminar with permission of the DUS and the instructor.

Summer program in Rome Humanities majors who take the course HUMS 444, The City of Rome (or its equivalent, with instructor approval), and develop individual research topics to be pursued in Rome, may apply for enrollment in a two-credit summer course offered by Yale Summer Session. Museums, archaeological sites, churches, piazzas, libraries, and the city itself are part of the classroom for the summer course. Further information is available on the Humanities program website and the Yale Summer Session website.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 14 term courses (incl senior essay)

Distribution of courses 3 foundations courses; 2 core sems, as specified; 1 course in each of 4 disciplinary areas; 4 electives in concentration

Senior requirement Senior essay (HUMS 491)

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*), 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*), Joseph North (*English*), Giulia Oskian (*Political Science*), Jessica Peritz (*Music*), Christiana Purdy Moudarres (*Italian*), Maryam Sanjabi (*French*), Katrin Truedstedt (*German*)

Senior Lecturers Peter Cole (*Judaic Studies*), Charles Hill (*Humanities*), 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, Brianna Bilsky (*Humanities*), Dane Collins, Matthew Croasmun (*Divinity School*), Joseph Gordon (*English*), Alfred Guy (*English*), Virginia Jewiss (*Humanities*), Katja Lindskog (*English*), Ryan McAnnally-Linz, Terence Renaud (*Humanities*), Karin Roffman (*Humanities, English*), Daniel Schillinger, George Syrimis (*Hellenic Studies*), Adam Van Doren (*School of Art*)

Senior Lector Constantine Muravnik (*Slavic Languages and Literatures*)

Lector Simona Lorenzini (*Italian*)

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 offer students a useful and challenging option in their university education. In particular, the Italian Studies major prepares 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 130 (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

The major consists of eleven term courses beyond the prerequisite. Eight term courses in the Italian Studies department numbered 140 or above (including graduate courses) are required, at least five of which must be conducted in Italian. The courses in the department must include either ITAL 150 or 151, a survey course on Italian literature (ITAL 162 or 172), and a course on Dante's *Divine Comedy* (ITAL 310 or equivalent), as well as three courses covering different periods in Italian Studies: one in the Middle Ages (in addition to the course on Dante's *Comedy*), one in the Renaissance, and one in modern Italian literature and media. The aim of these six 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.

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 491. 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 conversation 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 K, Special 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 Arrangements, "Year or Term Abroad."

REQUIREMENTS OF THE MAJOR

Prerequisite ITAL 130 or equivalent

Number of courses 11 term courses beyond prereq (incl senior req)

Specific courses required ITAL 150 or 151; ITAL 162 or 172; ITAL 310 or equivalent

Distribution of courses 8 term courses in Italian dept numbered 140 or above, incl 1 in Middle Ages (in addition to ITAL 310), 1 in Renaissance, and 1 in Italian lit and media, at least 5 of these conducted in Italian; 2 courses in other langs and lits, hist of art, hist, ling, phil, or media approved by DUS

Substitution permitted Any grad course in another national lit or in linguistics for 1 of the 2 courses in other depts, with DUS permission

Senior requirement Senior essay in Italian (ITAL 491) and a conversation 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 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 is listed on the student's official transcript.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, 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 the target language, such as an independent study course, a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course, which ordinarily is an advanced seminar with an additional weekly discussion section in the target language, to count toward the certification requirements. 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 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.

FACULTY OF THE DEPARTMENT OF ITALIAN

Professors Millicent Marcus, Giuseppe Mazzotta, Jane Tylus (*Chair*)

Assistant Professor Christiana Purdy Moudarres

Senior Lectors Michael Farina, Anna Iacovella

Lector Simona Lorenzini

Postdoctoral Associate Serena Bassi

Affiliated Faculty Paola Bertucci, (*History of Science, Medicine, and Public Health*), Howard Bloch (*French*), Jessica Brantley (*English*), Francesco Casetti (*Film and Media Studies*), Virginia Jewiss (*Humanities*), Jacqueline Jung (*History of Art*), Laurence Kanter (*Yale University Art Gallery*), Gundula Kreuzer (*Music*), Jessica Pertiz (*Music*), David Quint (*English and Comparative Literature*), Ayesha Ramachandran (*Comparative Literature*), Ellen Rosand (*Music*), Pierre Saint-Amand (*French*), Christophe Schuwey, (*French*), Gary Tomlinson (*Music*)

Judaic Studies

Directors of undergraduate studies: Paul Franks, (paul.franks@yale.edu) [Spring 2021], 406B Connecticut Hall; David Sorkin (david.sorkin@yale.edu), [Fall 2021, Spring 2022], HQ 270; judaicstudies.yale.edu

Judaic 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, Judaic Studies employs historical, literary, political, social, and philosophical methods of analysis.

The Judaic 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 the major in Judaic Studies should contact the director of undergraduate studies (DUS) as early as possible.

REQUIREMENTS OF THE MAJOR

The major in Judaic 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 concentration, 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 110; (2) a course in rabbinic literature or ancient Judaism, such as JDST 235; (3) JDST 200; (4) JDST 201; (5) a course in Jewish thought, such as JDST 281 or JDST 293; (6) a survey course in Hebrew and Jewish literature.

Language or literature requirements Students must complete either HEBR 110 and 120 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 concentration Students must select two of the following areas of concentration: 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 concentration.

In each of the two areas of concentration, 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 Judaic Studies, such as a course relating to the larger historical, literary, or philosophical context if the concentration is in a historical period,

or a course in the theory or practice of literature if the concentration is in Jewish/ Hebrew literature.

SENIOR REQUIREMENT

Students are required either to complete a two-term senior essay in JDST 491 and 492 related to both areas of concentration, or to complete a one-term senior essay in JDST 491 or 492 related to one area of concentration 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 Judaic 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 13 term courses (incl senior req)

Distribution of courses 3 courses from (1) Hebrew Bible, (2) rabbinic lit or ancient Judaism, (3) JDST 200, (4) JDST 201, (5) Jewish thought, (6) survey of Hebrew and Jewish lit; HEBR 110 and 120, or 2 courses in Hebrew lit in translation; 2 areas of concentration, with 3 courses in each for a total of 6

Senior requirement Two-term senior essay (JDST 491, 492) or one-term senior essay (JDST 491 or 492) and additional seminar

FACULTY ASSOCIATED WITH THE PROGRAM OF JUDAIC STUDIES

Professors Joel Baden (*Divinity School*), Leslie Brisman (*English*), Steven Fraade (*Religious Studies*), Paul Franks (*Philosophy*), Christine Hayes (*Religious Studies*), Hannan Hever (*Comparative Literature*), Nancy Levene (*Religious Studies*), Ivan Marcus (*History, Religious Studies*), Samuel Moyn (*Law*), Steven Smith (*Political Science, Philosophy*), David Sorkin (*History*), Katie Trumpener (*Comparative Literature, English*), Laura Wexler (*Women's, Gender, & Sexuality Studies, American Studies*), Robert Wilson (*Religious Studies*)

Associate Professors Marci Shore (*History*), Eliyahu Stern (*Religious Studies, History*)

Senior Lecturer Peter Cole (*Comparative Literature*)

Lecturer Margaret Olin (*Divinity School, History of Art, Religious Studies*)

Senior Lecturer II Shiri Goren

Senior Lectors Dina Roginsky, Orit Yeret

Lecturer 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; 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.

PREREQUISITES

Prerequisite to the major is knowledge of the two dominant languages of the region, Spanish and Portuguese. Depending on their interests, students select one language for two years of instruction and the other for one. Other languages necessary for research may in appropriate circumstances be substituted for the second language with the consent of the DUS. Students are encouraged to meet the language requirements as early as possible. Courses used to satisfy the language prerequisite may not be counted toward the major.

REQUIREMENTS OF THE MAJOR

The major itself requires twelve term courses: one introductory course approved by the DUS; eight courses related to Latin America from departmental offerings or from a provided list of electives; two additional electives; and the senior essay, LAST 491. The eight 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; and one seminar in any area related to Latin American Studies. Students wishing to count toward the major courses that do not appear in the program's course offerings 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, who can provide a list of appropriate courses.

SENIOR REQUIREMENT

The senior essay is a research paper written usually in one term in LAST 491. 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.

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 Arrangements, "Year or Term Abroad."

REQUIREMENTS OF THE MAJOR

Prerequisites 2 years of 1 lang (Spanish or Portuguese), 1 year of the other

Number of courses 12 courses beyond prereqs (incl senior essay)

Distribution of courses 1 intro course approved by DUS; 8 courses related to Latin America in specified fields; 2 electives; 3 sems or upper-level courses in junior and senior years, approved by DUS

Senior requirement Senior essay (LAST 491)

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 Saffile, Terry Seymour

Lector Selma Vital

Linguistics

Director of undergraduate studies: Jim Wood (jim.wood@yale.edu), 304 DOW, 432-2454; ling.yale.edu

Linguistics is the scientific study of language. The major in Linguistics offers a program of study leading toward an understanding of phonological, grammatical, and semantic structure and of various approaches to descriptive, experimental, and historical linguistics. Majors may concentrate on theoretical, experimental, or computational linguistics, on various aspects of comparative grammar, or on a particular family of languages. 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 100-level course.

REQUIREMENTS OF THE MAJOR

The major requires twelve term courses in linguistics and related areas, distributed as follows:

1. Breadth requirement (four courses). All majors must take a course in each of the core areas of phonology (LING 232) and syntax (LING 253). In addition, at least one course must be taken in any two of the six remaining core 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 core 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 200 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.
4. Research requirement (one course). LING 490, Research Methods in Linguistics, is required and is usually taken in the fall term of the senior year.

SENIOR REQUIREMENT

Senior requirement (one course). Students attend a research colloquium and write a senior essay in LING 491 during the 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 K, Special 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific courses required LING 232, 253, 490

Distribution of courses 1 course each in 2 addtl core areas, as specified; 2 addtl courses beyond intro level in 1 core area; 4 electives, at least 1 at the 200 level or above

Substitution permitted Electives from related programs with DUS approval

Senior requirement LING 491

FACULTY OF THE DEPARTMENT OF LINGUISTICS

Professors Claire Bower, Veneeta Dayal, Robert Frank, Laurence Horn (*Emeritus*), †Frank Keil, †Joshua Knobe, †Jason Stanley, †Zoltán Szabó, Petronella Van Deusen-Scholl (*Adjunct*), Raffaella Zanuttini (*Chair*)

Associate Professors Maria Piñango, Kenneth Pugh (*Adjunct*), Jason Shaw

Assistant Professors Natalie Weber, Jim Wood

Lector Julia Silvestri

Lecturers Roslyn Burns, Chelsea Sanker

†A joint appointment with primary affiliation in another department.

Mathematics

See also Applied Mathematics

Director of undergraduate studies: Andrew Neitzke, (andrew.neitzke@yale.edu) DL 425; associate director of undergraduate studies: Miki Havlickova (miki.havlickova), DL 446; 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.

PREREQUISITE

The prerequisite for both the B.A and B.S. degree programs is single variable calculus, through the level of MATH 115 or equivalent.

CALCULUS PLACEMENT PROCEDURES

The department offers a three-term sequence in calculus, MATH 112, 115, and 120. Students who have not taken calculus at Yale and who wish to enroll in calculus must take the mathematics online placement examination. Detailed information is available on the Math first year student resources site. A calculus advising session will be held prior to registration, to answer student questions about placement.

MATH 112 covers differential calculus, and assumes mastery of high school algebra, geometry, and trigonometry. Enrolling students are expected to know the basic definitions of the 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 110 and 111 in place of MATH 112.

The next course in the calculus sequence is MATH 115, which covers integral calculus, including sequences and series. It assumes mastery of the content of MATH 112 or equivalent (for example, AP Calculus AB).

MATH 120 covers multivariable calculus, and assumes mastery of the material in MATH 115 or equivalent (for example, AP Calculus BC).

INTRODUCTORY SEQUENCE FOR THE MATHEMATICS MAJOR

Students wishing to pursue study of mathematics typically enroll in MATH 225 (linear algebra and introduction to proofs), and MATH 255 (real analysis and introduction to proofs). MATH 225 and MATH 255 can be taken in either order, though it is recommended to take MATH 225 first.

Most students complete multivariable calculus before enrolling in MATH 225, however, prospective mathematics majors and students with interest in abstract mathematics may consider enrolling in MATH 225 directly after MATH 115 or equivalent, and complete their vector analysis/multivariable calculus requirement with MATH 302.

Students with a strong mathematical background that includes exposure to mathematical proofs are encouraged to consider the intensive version of the introductory sequence, MATH 226 and MATH 256.

Incoming students are encouraged to visit the Math first year student resources website for advice about choosing their mathematics courses.

REQUIREMENTS OF THE MAJOR

B.A. degree program The B.A. degree program normally consists of ten term courses in Mathematics numbered 222 or higher, including the senior requirement (MATH 475 or 480 or MATH 481); excluding, however, MATH 470. To acquire both depth and breadth in the field, students are required to take at least two term courses in each of three of the following five categories: analysis; algebra and number theory; statistics and applied mathematics; geometry and topology; and logic and foundations.

Introductory sequence requirement for students in the Class of 2025 and beyond:

Each student is expected to complete Linear algebra (MATH 225 or 226), Real analysis (MATH 255 or MATH 256), and Vector analysis or Multivariable calculus (MATH 302 or 120). MATH 222 is not recommended as a substitute for MATH 225 or 226, as it does not provide an introduction to proof writing, which is an essential skill for completing upper level mathematics courses.

Students in the Class of 2022, 2023, and 2024 who have not yet completed their introductory requirement (MATH 230 and 231, or 120 and 225 and 250) are encouraged to visit the Math curriculum revision website for detailed information about transitioning to the new introductory sequences.

B.S. degree program A candidate for the B.S. degree must take at least two advanced term courses in the physical sciences, such as ASTR 418, 420, 430, CHEM 333, 470, or PHYS 401, 402, 410, 412, 420, 430, 440, 441 in addition to the ten term courses required for the B.A. Such courses require the approval of the director of undergraduate studies (DUS); written approval is advised.

Both B.A. and B.S. degree programs Each major program must also include at least one course in at least two of the three core areas: real analysis; algebra; and complex analysis. Taking courses from all three core areas is strongly recommended.

Distinction in the major To be eligible for Distinction in the Major, a student must have completed at least one course from each of the three core areas. The categories and core areas to which each course belongs are indicated in the course listings.

The intensive major Candidates for a degree with an intensive major in Mathematics must take courses in all three of the core areas: real analysis; algebra; and complex analysis. Intensive majors are also expected to include at least two graduate term courses in the Mathematics department, or equivalent independent study, in their programs. Familiarity with the material of the following courses is prerequisite to graduate courses in each category: *algebra*: MATH 350 and MATH 370; *analysis*: MATH 305, 310; *algebraic topology*: MATH 350, 430; *logic and foundations*: MATH 270.

Substitutions With permission of the Math DUS, up to two courses from other departments may be counted towards the required courses. For a list of courses that are typically approved, visit the FAQ page on the Math department website.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

SENIOR REQUIREMENT

During the senior year students majoring in Mathematics normally take the senior seminar (MATH 480 or MATH 481). Alternatively, with the consent of the DUS, students may write a senior essay in MATH 475 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 DUS at least six months prior to enrolling in MATH 475, 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 302, 305, 310, 350, 370, and 430 in their programs, and should consider taking one or more graduate-level courses. Students interested in applications of mathematics should include MATH 302, 310, 350, and a selection of courses from MATH 241, 242, 244, 246, 251, 260, and CPSC 440.

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 & Data Science, or other departments. In some instances a limited number of such courses may be counted among the ten courses required for the major in Mathematics, with the approval of the DUS.

Graduate work Each year the Mathematics and Statistics & Data Science departments offer a large number of graduate courses, some of which are accessible to undergraduates with advanced preparation in mathematics. Further information may be obtained from the DUSes, whose permission, with that of the relevant director of graduate studies, is required for admission.

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 term courses numbered 500 or higher, 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.A. or 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 Section K, Special Arrangements, “Simultaneous Award of the Bachelor’s and Master’s Degrees,” in the Academic Regulations.

REQUIREMENTS OF THE MAJOR

Prerequisite Single-variable calculus through MATH 115 or equivalent

Number of courses *B.A.* – 10 term courses numbered 222 or higher (incl senior essay), excludes MATH 470; *B.S.* – same, with 2 addtl adv courses in physical sciences approved by DUS

Specific courses required *B.A. and B.S.* – MATH 225 or MATH 226; MATH 255 or MATH 256; MATH 302 or MATH 120

Distribution of courses *B.A. and B.S.* – 2 courses in each of 3 categories chosen from: analysis; algebra and number theory; stat and applied math; geometry and topology; logic and foundations; 1 course from 2 of 3 core areas chosen from: real analysis; algebra; and complex analysis

Substitution permitted With DUS permission, up to 2 courses from other depts, as specified

Intensive major Courses in all 3 core areas; 2 MATH grad courses or equivalent independent study counted among the required courses

Senior requirement Senior sem (MATH 480 or MATH 481) or, with DUS permission, senior essay (MATH 475) and oral report

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, Franco Vargas Pallete, Cosmin Pohoata, Congling Qiu, Ebru Toprak.

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: Andrew Neitzke (Mathematics), DL 425; associate director of undergraduate studies: Miki Havlickova (miki.havlickova@yale.edu) (Mathematics), DL 446; Daniel Greco (daniel.greco@yale.edu) (Philosophy), 106A C, 432-1687

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 120. Students who completed multivariable calculus during high school may consult with the DUSes about substituting a higher level mathematics course.

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 at the 200 level or higher and five must be in philosophy. All philosophy courses are eligible for credit toward the major, with the exception of First-Order Logic (PHIL 115). Required courses include Set Theory (MATH 270), Mathematical Logic (PHIL 267), Computability and Logic (PHIL 427), an additional advanced philosophy course with a substantive logical component, and one seminar in either mathematics or philosophy (other than PHIL 427) that fulfills the senior requirement (see below). Set Theory (MATH 270) and Mathematical Logic (PHIL 267) 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 allowed.

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 in order 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 MATH 480 or MATH 481 fulfill the senior requirement. For philosophy seminars that fulfill the senior requirement, consult the director of undergraduate studies (DUS) in Philosophy.

Credit/D/Fail At most one course taken Credit/D/Fail may be applied toward the major, with permission of the DUSes. The following courses must be taken for letter grades: MATH 270, PHIL 267, PHIL 427; the required mathematics courses level 200 or higher; the additional philosophy course with an advanced logic component; and the senior seminar.

ADVISING

A typical program satisfying the major might consist of MATH 120, 222 or 225 or 226, 270, 300, 350, and a designated seminar; PHIL 126, 267, 427, a designated seminar (other than PHIL 427), and two additional electives.

REQUIREMENTS OF THE MAJOR

Prerequisite MATH 120

Number of courses 12 term courses (incl prereq and senior sem)

Specific courses required MATH 270, PHIL 267, 427

Distribution of courses At least 4 courses in MATH at 200 level or higher; at least 5 courses in PHIL, as specified; 1 additional PHIL course with adv logic component

Senior requirement Senior seminar or MATH 480 or MATH 481

Mathematics and Physics

Adviser for the major: Vincent Moncrief (vincent.moncrief@yale.edu), 64 SPL, 432-6930

Directors of undergraduate studies: Andrew Neitzke (andrew.neitzke@yale.edu) (Mathematics), DL 425; associate director of undergraduate studies: Miki Havlickova (miki.havlickova@yale.edu) (Mathematics), DL 446; Nikhil Padmanabhan (nikhil.padmanabhan@yale.edu) (Physics), EVN 207

The major in Mathematics and Physics allows students to explore the productive interaction between the two subjects more extensively than either individual major.

PREREQUISITES

Prerequisites to the major include MATH 120 or its equivalent, an introductory physics lecture sequence numbered PHYS 180, 181 or above, and the associated laboratory sequence PHYS 205L, 206L.

Students who completed multivariable calculus during high school may consult with directors of undergraduate studies (DUSes) about substituting a higher level mathematics course for MATH 120. The course being substituted will not count toward the total of fourteen term courses (beyond the introductory level) required for the major.

REQUIREMENTS OF THE MAJOR

Beyond the prerequisites, the major requires a minimum of fourteen term courses above the introductory level, including the senior project. At least six of these must be Mathematics courses numbered 222 or above, and at least six must be advanced Physics courses chosen in consultation with the adviser for the major.

A course must be listed with a Math number to count toward the mathematics requirements – substitutions from other departments are not allowed.

SENIOR REQUIREMENT

A senior project in PHYS 471 or 472 on a topic appropriate for the combined major and acceptable to both the Physics and the Mathematics departments is also required. The student must present an oral report on this project to the Mathematics department.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the major.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 120 or equivalent; PHYS 180, 181, or 200, 201, or 260, 261; PHYS 205L, 206L

Number of courses 14 term courses beyond prereqs, incl senior req

Distribution of courses 6 Math courses numbered 222 or above; 6 advanced Physics courses selected in consultation with major adviser

Senior requirement Senior project in PHYS 471 or 472 on topic acceptable to both depts; oral report on project to Math dept

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 and Materials Science 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 and Materials Science: 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 115) by the end of their first year.

A student's undergraduate engineering program may include one or more special project courses (MENG 471, 472, 473, or 474), 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**

Prerequisites for the Class of 2022 and 2023 Students may follow the prerequisites that were in place when they declared their major.

Prerequisites for the Class of 2024 and beyond The prerequisites in mathematics are MATH 112, 115, and ENAS 151, or the equivalent. The basic science prerequisites are PHYS 180, 181, or 200, 201; one laboratory from PHYS 165L or 205L, and one from PHYS 166L or 206L, or equivalents, and one introductory lecture course in chemistry, numbered CHEM 161 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 112, 115, and ENAS 151, or the equivalent. The basic science prerequisites are PHYS 180, 181, or 200, 201; one laboratory from PHYS 165L or 205L, and one from PHYS 166L, 206L, or MENG 286L.

B.A. degree program in Engineering Sciences (Mechanical) The prerequisites in mathematics are MATH 112 and 115. The basic science prerequisite is physics at least to the level of PHYS 170, 171.

REQUIREMENTS OF THE MAJOR

B.S. degree program in Mechanical Engineering requires 20 courses and 19 credits beyond the prerequisites as follows:

Requirements for the Class of 2022 and 2023 If not taken as a prerequisite, one lecture course in chemistry numbered CHEM 161 or higher is required, as well as the requirements listed below. The chemistry lecture requirement 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.

Requirements for the Class of 2024 and beyond

1. Advanced mathematics: ENAS 194 and MATH 222 or 225
2. Mechanical engineering and related: MENG 185, 211, 280, 285, 286L, MENG 325, 361, 363L, 383, 389, 390, MENG 487L and MENG 488L (the senior requirement), ENAS 130, EENG 200
3. Technical electives: three approved technical electives chosen in consultation with the DUS; only one course from MENG 471, 472, 473, and 474 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 term courses in engineering (with only one course from MENG 471, 472, 473, or 474), 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 term courses in engineering (with only one course from MENG 471, 472, 473, or 474), beyond the prerequisites, including the senior project. Students should consult with the DUS at the beginning of their sophomore year.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the Mechanical Engineering major, including prerequisites.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

B.S. degree program in Mechanical Engineering Students satisfy the senior requirement by taking MENG 487L (full-credit) and MENG 488L (half-credit) in the senior year.

B.S. degree program in Engineering Sciences (Mechanical) Students satisfy the senior project requirement by completing MENG 404; 471, 472, 473, or 474; or another upper-level design course (taken during the senior year) chosen in consultation with the DUS. Only one course from MENG 471-474 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 471, 472, 473, or 474; or another upper-level design course (taken during their senior year) chosen in consultation with the DUS. Only one course from MENG 471- 474 may be counted toward the requirements of the major.

REQUIREMENTS OF THE MAJOR

MECHANICAL ENGINEERING, B.S.

Prerequisites MATH 112, 115, and ENAS 151, or equivalent; PHYS 180, 181, or 200, 201, and 2 labs (1 from PHYS 165L or 205L; 1 from PHYS 166L or 206L, or equivalents), and 1 introductory chemistry lecture course

Number of courses 20 term courses and 19 credits beyond prerequisites (including senior req)

Specific courses required ENAS 130 and 194; EENG 200; MATH 222 or 225; MENG 185, 211, 280, 285, 286L, MENG 325, 361, 363L, 383, 389, 390

Distribution of courses 3 technical electives chosen in consultation with DUS (only one of MENG 471, 472, 473, or 474)

Substitution permitted With DUS approval

Senior requirement MENG 487L and MENG 488L taken in senior year

ENGINEERING SCIENCES (MECHANICAL), B.S.

Prerequisites MATH 112, 115, and ENAS 151, or equivalent; PHYS 180, 181, or 200, 201, and 2 labs (1 from PHYS 165L or 205L; 1 from PHYS 166L, 206L, or MENG 286L)

Number of courses 12 term courses beyond prerequisites (incl senior req)

Substitution permitted With DUS approval

Senior requirement MENG 404; 471, 472, 473, or 474; or another upper-level design course chosen in consultation with the DUS

ENGINEERING SCIENCES (MECHANICAL), B.A.

Prerequisites MATH 112, 115; PHYS 170, 171 or higher

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

Substitution permitted With DUS approval

Senior requirement MENG 471, 472, 473, or 474; or another upper-level design course chosen in consultation with the DUS

FACULTY OF THE DEPARTMENT OF MECHANICAL ENGINEERING AND MATERIALS SCIENCE

Professors Charles Ahn, Ira Bernstein (*Emeritus*), Aaron Dollar, Juan Fernández de la Mora, Alessandro Gomez, †Sohrab Ismail-Beigi, †Shun-Ichiro Karato, Marshall Long, Corey O'Hern, +Vidvuds Ozolins, +Brian Scassellati, Jan Schroers, Udo Schwarz (*Chair*), Mitchell Smooke

Associate Professor Judy Cha

Assistant Professors Rebecca Kramer-Bottiglio, Diana Qiu, Madhusudhan Venkadesan

Lecturers Beth Anne Bennett, Joran Booth, Joseph Zinter

Medieval Studies Certificate

Certificate director: Emily Thornbury (emily.thornbury@yale.edu), 203-432-0672; 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 inter alia, 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 studies.

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 Asia; South Asia; the Near East; and Europe. 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, a multidisciplinary academic program, 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 to be credited for attendance. There are typically six Yale lectures in Medieval Studies every academic year, as well as Medieval Lunch talks. Notice of these events can be found on the Medieval Studies website.

Completion Procedure and Advising

Students must apply for the Certificate at latest one week before final schedules are due in their final semester of study, by completing the form on the Medieval Studies website attesting fulfillment of all requirements, and submitting it for approval to the Certificate director. Final approval of the certificate rests with the Certificate committee and director.

REQUIREMENTS OF THE CERTIFICATE

Number of courses 5 course credits dispersed between the four zones (East Asia, South Asia, the Near East, Europe)

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: Kaveh Khoshnood (kaveh.khoshnood@yale.edu),
Laboratory of Epidemiology and Public Health, 60 College St., Ste. 826, 785-2920;
www.yale.edu/macmillan/cmcs

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, Judaic 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

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 include two courses from two different regions or countries within the Middle East, two courses from different departments or programs, and two that focus substantially on the period before 1750. These courses must draw from distinct methodological or disciplinary approaches and must include two advanced seminars. Up to two language courses below L5 in a Modern Middle East language may count toward the distributional requirement with approval of the director of undergraduate studies (DUS). The proposed course of study also requires 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 491, 492, 493) 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.

REQUIREMENTS OF THE MAJOR

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 491), two term senior essay (MMES 492, 493), or essay written in additional seminar

FACULTY ASSOCIATED WITH THE PROGRAM OF MODERN MIDDLE EAST STUDIES

Professors Abbas Amanat (*History, Emeritus*), Gerhard Böwering (*Religious Studies*), John Darnell (*Near Eastern Languages & Civilizations*), Stephen Davis (*Religious Studies*), Ben Foster (*Near Eastern Languages & Civilizations*), Steven Fraade (*Religious Studies*), Eckart Frahm (*Near Eastern Languages & Civilizations*), Frank Griffel (*Religious Studies*), Christine Hayes (*Religious Studies*), Hannan Hever (*Comparative Literature*), Marcia Inhorn (*Anthropology*), Anthony Kronman (*Law School*), Joseph Manning (*Classics, History*), Ivan Marcus (*History*), Alan Mikhail (*History*), A. Mushfiq Mobarak (*School of Management*), Robert Nelson (*History of Art*), Kishwar Rizvi (*History of Art*), Maurice Samuels (*French*), Shawkat Toorawa (*Near Eastern Languages & Civilizations*), Kevin van Bladel (*Near Eastern Languages & Civilizations*), Harvey Weiss (*Near Eastern Languages & Civilizations*)

Associate Professors Zareena Grewal (*American Studies*), Kaveh Khoshnood (*Public Health*), Eliyahu Stern (*Religious Studies*), Jonathan Wrytzen (*Sociology*), Travis Zadeh (*Religious Studies*)

Assistant Professors Thomas Connolly (*French*), Robyn Creswell (*Comparative Literature*), Supriya Gandhi (*Religious Studies*), Samuel Hodgkin (*Comparative Literature*), Jill Jarvis (*French*), Elizabeth Nugent (*Political Science*), Eda Pepi (*Women's, Gender, & Sexuality Studies*), Evren Savci (*Women's, Gender, & Sexuality Studies*)

Senior Lecturers Tolga Köker (*Economics*), Kathryn Slanski (*Near Eastern Languages & Civilizations*)

Lecturers Karla Britton (*Architecture*), Teresa Chahine (*School of Management*), Karen Foster (*History of Art*), Nicholas Lolito (*Political Science*), Emma Sky (*Global Affairs*)

Senior Lecturer II Shiri Goren

Senior Lectors Sarab Al Ani, Muhammad Aziz, Jonas Elbousty, Ozgen Felek, Dina Roginsky, Farkhondeh Shayesteh

Lector Orit Yeret

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

The programs offered by the Department of Molecular Biophysics and Biochemistry are planned for students interested in the molecular and chemical basis of biological processes and are well suited to students hoping to attend medical school or pursue graduate studies in biochemistry, molecular biology, genetics, or biophysics. The B.S. major, designed for those with a strong commitment to research, provides an intensive introduction to laboratory techniques in biochemistry and biophysics. Students in this program usually carry out research projects in faculty laboratories during their junior and senior years. The B.A. major provides the intellectual discipline of biochemistry and biophysics for students who also wish to have sufficient time to pursue in-depth studies outside the major or who are interested in molecular biology as a liberal education; they too may engage in research during their junior and senior years.

PREREQUISITES

The basic science courses required of all majors include four half-term units of foundational biology (BIOL 101, 102, 103, 104); a two-term lecture sequence in general chemistry with its associated laboratories; a first term course in organic chemistry with its associated laboratory; and two terms of calculus (MATH 112 and 116). BIOL 101, 102, chemistry, and mathematics prerequisites may be satisfied by scores on Advanced Placement tests or placement examinations sufficient to earn acceleration credits in the particular subjects, even if the student does not choose to accelerate. BIOL 103 and 104 may be waived in consultation with an MB&B faculty advisor and permission of the director of undergraduate studies (DUS).

REQUIREMENTS OF THE MAJOR

The major requirements for the Class of 2024 and previous classes With approval from the DUS, the following changes to the major may be fulfilled by students who declared their major under previous requirements.

The following changes to the major requirements for the Class of 2025 and subsequent classes apply for the B.S. degree, the B.A. degree, and the B.S./M.S. degree.

B.S. degree program Thirteen course credits are required beyond the prerequisites: a second term of organic chemistry; two term courses in physics numbered PHYS 170 or higher; MB&B 275 or one term of physical chemistry followed by MB&B 302 or equivalent; MB&B 251L, 300, 301, and 490; two additional upper-level MB&B electives, one of which must not be a laboratory or independent research course; one quantitative reasoning elective (e.g., MATH 120 or above, S&DS 105 or 230 or above, CPSC 201 or above, or ENAS 130 or above); one elective in the natural sciences at a level higher than required in the prerequisites; and MB&B 268, a half-credit seminar taken concurrently with a humanities course elective. Only two course credits of independent research MB&B 470, 471, and 478, 479 may count toward these electives. The quantitative reasoning requirement may not be fulfilled by Advanced Placement test scores.

B.A. degree program Eleven course credits are required beyond the prerequisites: a second term of organic chemistry; two term courses in physics numbered PHYS 170 or higher; MB&B 275 or one term of physical chemistry; MB&B 251L, 300, 301, and 490; one additional upper-level MB&B elective; one quantitative reasoning elective (e.g., MATH 120 or above, S&DS 105 or 230 or above, CPSC 201 or above, or ENAS 130 or above); and MB&B 268, a half-credit seminar taken concurrently with a humanities course elective. Students choose the elective courses in consultation with a faculty adviser (see below). The quantitative reasoning requirement may not be fulfilled by Advanced Placement test scores.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

The senior requirement for both the B.S. and the B.A. is fulfilled by successful completion of the senior project, MB&B 490. Students enrolled in this course prepare a written report and make an oral presentation of a literature project. Students meet with faculty members in charge of the colloquium during the first two weeks of the spring term 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. It is inappropriate for students to submit a revised version of a past research report or to resubmit a literature paper prepared for another course. The literature project for the senior requirement should be original work approved by the faculty member overseeing the senior colloquium.

The written report is expected to be 15–25 pages in length (double-spaced, twelve-point font, exclusive of figures). A first draft of the paper is due two weeks prior to the date of the oral presentation. Faculty in charge of the program will review the draft and return it to the student with suggestions. A final draft of the paper is due the first day of the reading period in the student's final term.

Students make a fifteen-minute oral presentation during the last three weeks of their final term in a general scientific forum open to the public. Other students in the series are expected to attend all presentations.

ADVISING

Recommended courses All B.S. majors are encouraged to include MB&B 470 or 471 among their MB&B electives. Declared MB&B majors may take up to two credits of these independent research courses for a letter grade. The prerequisites in either general or organic chemistry should be taken in the first year.

Students with a strong interest in biophysics, including those planning to attend graduate school, are strongly encouraged to take courses beyond the basic requirements of the major. Such students are advised to take mathematics through differential equations (ENAS 194, MATH 246, or PHYS 301) and a full year of physical chemistry (CHEM 332 and 333). Thoughtful revisions to the basic curriculum can be made in consultation with the faculty adviser and are subject to approval by the DUS.

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 DUSes 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.

Typical programs Diverse pathways exist for navigating the B.A. and B.S. degrees with the minimum first-year requirements of BIOL 101, 102, 103 and 104, general chemistry with labs (e.g. CHEM 161, 165, 134L and 136L), and introductory calculus (e.g. MATH 112). For further examples, including the use of acceleration credits and DUS approved waivers, see the MB&B undergraduate handbook.

Combined B.S./M.S. degree program A very small number of students will be eligible to complete a six-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 K, Special 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 Molecular Biophysics and Biochemistry.

MB&B faculty advisory system Two MB&B faculty serve as academic advisers for each class year. Students may choose either of the advisers as listed for their class year and maintain an advising relationship throughout their studies. The advisers are apprised of curriculum-related details for each year. Members acting as faculty advisers are:

Class of 2022:

C. Paulsen, 234 BASS (432-5342)

M. Koelle, CE28A SHM (737-5808)

Class of 2023:

L. Kabeche, West Campus

M. Hochstrasser, 228 BASS (432-5101)

Class of 2024:

F. Bleichert, YSB 345 (432-8411)

A. Miranker, 220 BASS (737-3274)

Class of 2025:

TBD

REQUIREMENTS OF THE MAJOR

Prerequisites B.S. and B.A. – BIOL 101, 102, 103, and 104; a two-term lecture sequence in general chem, with labs, and 1 term of organic chem with lab; MATH 112, 116

Number of courses B.S. – 13 term course credits beyond prereqs, incl senior req; B.A. – 11 term course credits beyond prereqs, incl senior req

Specific courses required B.S. and B.A. – MB&B 251L, 268, 300, 301

Distribution of courses B.S. – a second term of organic chem; MB&B 275 or one term of physical chemistry followed by MB&B 302 or equivalent; 2 terms of PHYS 170 or above; 2 addtl upper-level MB&B electives, 1 quantitative reasoning elective, and 1 natural science elective, all as specified; B.A. – a second term of organic chem; 2 terms of PHYS 170 or above; MB&B 275 or one term of physical chemistry; 1 addtl upper-level MB&B elective and 1 quantitative reasoning elective, as specified

Senior requirement Senior project (MB&B 490)

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, Alan Garen, Mark Gerstein, Nigel Grindley (*Emeritus*), † Sharon Hammes-Schiffer, Mark Hochstrasser, Jonathon Howard, Michael Koelle, Anthony Koleske, William Konigsberg, †Mark Lemmon, †Patrick Loria, †I. George Miller, Andrew Miranker, †Peter Moore (*Emeritus*), Karla Neugebauer, †Thomas Pollard, †Karen Reinisch, †David Schatz, Robert Schulman (*Emeritus*), †Frederick Sigworth, Dieter Söll, Mark Solomon, Joan Steitz, Scott Strobel, Yong Xiong

Associate Professors Julien Berro, †Titus Boggon, Wendy Gilbert, Christian Schlieker, Matthew Simon, Chuck Sindelar, †Shervin Takyar, †Yongli Zhang

Assistant Professors Franziska Bleichert, †Luisa Escobar-Hoyos, Lilian Kabeche, †Erdem Karatekin, †Zachary Levine, Nikhil Malvankar, †Wei Mi, Candice Paulsen, †Sarah Slavoff, Kai Zhang

Adjunct Professors Kenneth Williams, Carl Zimmer

Lecturer Aruna Pawashe

†A joint appointment with primary affiliation in another department.

Molecular, Cellular, and Developmental Biology

Director of undergraduate studies: Valerie Horsley (valerie.horsely@yale.edu), 121 YSB, 432-3839; MCDB undergraduate registrar, (mcdb.ureg@yale.edu) 231 YSB, 260 Whitney Ave., 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 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

The foundational biology courses required of all MCDB majors are BIOL 101, 102, 103, and 104. All majors must also complete a course in mathematics numbered MATH 115 or higher or a statistics course taken at Yale and approved by the director of undergraduate studies (DUS).

For the B.A. degree, additional prerequisites are a two-term lecture sequence in chemistry, and a term course in physics numbered PHYS 170 or higher.

For the B.S. degree, additional prerequisites are a two-term lecture sequence in chemistry, with associated laboratories; a term course in organic chemistry with its associated laboratory; and two term courses in physics numbered PHYS 170 or higher.

PLACEMENT PROCEDURES

Placement in MCDB courses is determined by examinations administered at Yale. A student may place out of one or more courses in the BIOL 101–104 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.

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 115 or higher are encouraged to take additional mathematics courses, such as MATH 120, 222, or 225, or ENAS 151 or 194. 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, including five lecture or seminar courses and one laboratory, as follows:

1. Two core courses selected from MCDB 200, 202, 205, 210, 290, 300 (or MB&B 300)
2. Two general electives selected from MCDB courses numbered 250 or above, or two additional core courses from the list above. Two laboratory courses, either MCDB 342L and 343L or MCDB 344L and 345L, 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 350 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, including eight lecture or seminar courses and two laboratories, as follows:

1. Three core courses selected from MCDB 200, 202, 205, 210, 290, 300 (or MB&B 300)
2. Two general electives selected from MCDB courses numbered 250 or above. Additional core courses from the list above, a second term of organic chemistry, and courses in statistics may be used as general electives. Two laboratory courses, either MCDB 342L and 343L or MCDB 344L and 345L, 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 350 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).

Independent research courses before senior year The only independent research course available to students prior to the senior year is MCDB 474. 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 475, 485, 486, and 495, 496 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 counted toward the MCDB major, including prerequisites.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

For the Class of 2022, if it is problematic to fulfill the senior research requirement in person due to outside circumstances, students seeking the MCDB B.S. degree (only) should consult the MCDB website and may appeal to the DUS for MCDB course substitutions. No accommodations will be allowed for the B.S. Intensive degree and B.S./M.S. degree.

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 track 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 475). 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.

B.S. degree program For the B.S. degree, the senior requirement is usually fulfilled by completing a yearlong research course, MCDB 485, 486. 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 495, 496 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.

REQUIREMENTS OF THE NEUROBIOLOGY, BIOTECHNOLOGY, AND QUANTITATIVE BIOLOGY TRACKS

Neurobiology track In addition to the core courses for the B.A. degree or the B.S. degree programs, the Neurobiology track requires MCDB 320. One elective is selected from MCDB courses numbered 350 or above and one is selected from BENG 410, CPSC 475, MCDB 250, 310, 315, 415, 425, 430, 440, MCDB 361, PSYC 376, or S&DS 101. Other courses may be substituted with the approval of the student's track adviser. (Students should note that PSYC 110 is a prerequisite for many psychology courses but does not substitute as an elective in the Neurobiology track.) The laboratory requirement and the senior requirement are the same as those for the B.A. degree or the B.S. degree programs. Students interested in the Neurobiology track should consult an adviser for the track.

Neurobiology track advisers

P. Forscher, 120 YSB (432-6344)
H. Keshishian, 228 YSB (432-3478)
R. Wyman, 139 YSB (432-3475)
W. Zhong, 225 YSB (432-9233)

Biotechnology track In addition to the core courses for the B.A. degree or the B.S. degree programs, the Biotechnology track requires MCDB 370. One elective is selected from MCDB courses numbered 350 or above and one is selected from MB&B 420, 421, 443, BENG 351, 352, 410, 435, 457, 463, 464, CENG 210, 411, 412L, CPSC 437, 445, 470, or 475. The laboratory requirement and the senior requirement are the same as those for the B.A. degree or the B.S. degree programs. Students interested in the Biotechnology track should consult an adviser for the track.

Biotechnology track 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 track In addition to the core courses for the B.A. degree or the B.S. degree programs, the Quantitative Biology track requires MCDB 330. One elective is selected from MCDB courses numbered 350 or above and one is selected from MCDB 320, 361, 461, BENG 463, 467, CPSC 440, 475, MB&B 302, 435, 452, 523, PHYS 402, MATH 246, 251, or CPSC 475, 440. The laboratory requirement and the senior requirement are the same as those for the B.A. degree or the B.S. degree programs. Students interested in the Quantitative Biology track should consult an adviser for the track.

Quantitative Biology track advisers

M. Acar, West Campus B-31 (737-3255)

D. Clark, C148 YSB (432-0750)

T. Emonet, C169 YSB (432-3516)

D. Kankel, 111 YSB (432-3532)

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. 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 tracks should consult an adviser for their track (listed above). The course schedules of all MCDB majors (including sophomores intending to major in MCDB) must be signed by a faculty member in the department with a primary appointment in MCDB. The signature of the DUS is required **only** for students who are fulfilling the requirements of two majors or who have been admitted to the simultaneous B.S./M.S. degree program. 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, T. Pollard
BK	V. Irish, J. Wolenski	MY	S. Bahmanyar, D. Clark, C. Crews, J. Gendron
BR	I. Dawson, T. Emonet, S. Hatzios, J. van Wolfswinkel, D. Breslow	PC	J. Carlson, V. Horsley, N. Dimitrova
DC	S. Dellaporta, P. Forscher, W. Zhong	SM	J. Rosenbaum
ES		SY	
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 585, 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 595, 596, a four-credit, yearlong course that is similar to MCDB 495, 496 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 K, Special 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.

REQUIREMENTS OF THE MAJOR

Prerequisites *B.A.* – BIOL 101, 102, 103, 104; a two-term lecture sequence in chem; one term of PHYS 170 or above; MATH 115 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 170 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 major* – 8 courses and 2 labs, totaling at least 11 course credits beyond prereqs

Specific courses required *Biotechnology track* – MCDB 370; *Neurobiology track* – MCDB 320; *Quantitative Biology track* – MCDB 330

Distribution of courses *B.A.* – 2 core courses from MCDB 200, 202, 205, 210, 290, 300 (or MB&B 300); 2 electives numbered MCDB 250 or above (or 2 addtl core courses); 1 elective numbered MCDB 350 or above; 1 biology lab; *B.S.* – 3 core courses from MCDB 200, 202, 205, 210, 290, 300 (or MB&B 300); 2 electives numbered MCDB 250 or above (or 2 addtl core courses); 1 elective numbered MCDB 350 or above; 2 MCDB labs; *Biotechnology, Neurobiology, and Quantitative Biology tracks* – same as *B.A.* and *B.S.* degree programs, with a specific req (track dependent) in place of one general elective

Senior requirement *B.A.* – MCDB 475 taken in senior year, or senior essay; *B.S.* – 2 consecutive terms of independent research in senior year, MCDB 485, 486; *B.S., intensive major* – MCDB 495, 496 in senior year

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, Valerie Horsley, Vivian Irish, †Akiko Iwasaki, Douglas Kankel, †Paula Kavathas, Haig Keshishian, Mark Mooseker, Thomas Pollard, Anna Pyle, Joel Rosenbaum, †Hugh Taylor, Robert Wyman

Associate Professors Damon Clark, Joshua Gendron, Farren Isaacs, †Megan King, †Kathryn Miller-Jensen, Weimin Zhong

Assistant Professors Shirin Bahmanyar, David Breslow, Nadya Dimitrova, Stavroula Hatzios, Yannick Jacob, 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), 205 STOECK, 432-2996; 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 for careers in music.

COURSES FOR NONMAJORS AND MAJORS

Introductory courses, numbered from 100 to 199, 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, only two 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 345), graded Pass/Fail; or (3) lessons for academic credit at the advanced level (MUSI 445), graded A-F. Only students with exceptional proficiency are placed into MUSI 445.

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 100 to 199. Intermediate courses, numbered between 200 and 399, may require prerequisites or a familiarity with music notation. Advanced courses, numbered between 400 and 494, 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 345 or 445 are required to enroll concurrently in an introductory or intermediate music theory or musicianship course (MUSI 100, 110, 210, 211, 218, or 219) for two terms, or they must complete one term of the theory/musicianship requirement before enrolling in MUSI 345 or 445 for the first time, and another before enrolling in MUSI 345 or 445 again. MUSI 345 is taken Pass/Fail; MUSI 445 and the corequisites are taken for a letter grade.

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 to consult with the course instructors.

REQUIREMENTS OF THE MAJOR

Thirteen courses are required, two intermediate courses and one advanced course in each of four groups, and the senior requirement. Group I (MUSI 200–219; 300–319; 400–419) includes music theory and technology courses focused on the materials and structures of musical works and repertoires. Group II (MUSI 220–249; 320–349; 420–449) includes composition, technology, and performance courses with a practical focus on techniques of artistic production. Group III (MUSI 250–274; 350–374; 450–474) includes lectures and seminars taking a research- and writing-based approach to the Western art-music tradition. Group IV (MUSI 275–299; 375–399; 475–494) includes lectures and seminars taking a research- and writing-based approach to popular or vernacular music or to music of non-Western traditions.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

SENIOR REQUIREMENT

Each student majoring in Music must satisfy the senior requirement by completing a senior essay, composition, or recital in MUSI 496, 497, 498, or 499.

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 497–499). 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 497–499). 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 700 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 K, Special Programs, “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. Students in the Class of 2022 may fulfill the Yale College requirements that were in place when they were accepted into the B.A./M.M. program.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 13 term courses numbered 200 or above (incl senior req)

Specific courses required None

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 496–499

Intensive major Two-term senior essay or project in MUSI 497–499; additional course is supplementary to the thirteen course req

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*), Anna Zayaruznaya

Assistant Professors Maria-Christina Oliveras (*Visiting*), Jessica Peritz

Lecturers Nathaniel Adam, Trevor Bača, FNU Darsono, Daniel Egan, Grant Herreid, Maho Ishiguro, Annette Jolles, Sara Kohane, Joshua Rosenblum, Wendy Sharp, Jeanine Tesori

Naval Science

Program adviser: Commander Adam Schlismann (adam.schlismann@yale.edu), USN, Rm. 430, 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 (USN) or Marine Corps (USMC). NROTC develops future officers mentally, morally, 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, and weapons systems. 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. 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 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.

For Navy students, the usual sequence of Naval Science courses is:

First-Year	Sophomore	Junior	Senior
Introduction to Naval Science	Leadership & Management	Naval Engineering	Naval Operations
Navigation	Seapower & Maritime Affairs	Naval Systems	Leadership & Ethics

Marine 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	Leadership & Management	Elective	Evolution of Warfare
Elective	Seapower & Maritime Affairs	Fundamentals of Maneuver Warfare	Leadership & Ethics

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 (USNR) or United States Marine Corps Reserve (USMCR), 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. Yale students who matriculate without a scholarship may apply for the National Scholarship program during the fall term of their first year.

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 DEPARTMENT OF NAVAL SCIENCE

Professor Captain Ronald Withrow, USN (*Adjunct*)

Lecturers Commander Adam Schlismann, USN; Captain Ratsamy May, USMC; LT Samantha Barszowski, USN; Lieutenant Quinlan Melvin, USN; Lieutenant Brandon Ordway, USN; LT Dale Pettenski, USN

Near Eastern Languages and Civilizations

Director of undergraduate studies: Jonas Elbousty (jonas.elbousty@yale.edu), Arnold Hall, Room B41A, 304 Elm Street, 432-2944; nelc.yale.edu

The major in Near Eastern Languages & Civilizations is an interdisciplinary liberal arts major. Students acquire language proficiency and skills in critical analysis in order to study the long-lived and rich civilizations of the Near East, ranging from ancient Mesopotamia and Egypt, to the medieval Near East and classical Islam, to modern cultures represented by modern Arabic, Hebrew, Persian, and Turkish.

The Near East is studied for its own intrinsic literary, historic, and artistic interest, as well as its cultural and historical legacies, while also providing new ways of understanding developments and challenges in the modern world. Majors go on to careers in government, foreign service, law, medicine, education, and academic research. The major also provides an excellent basis for graduate study.

REQUIREMENTS OF THE MAJOR

The Near Eastern Languages and Civilizations major has two concentrations from which students may choose. In the Language and Civilization concentration, students focus in depth on a particular language, civilization, period, or region. In the Languages, Civilization, and Culture concentration, students focus on Near Eastern languages and civilizations more broadly and comparatively.

Twelve term courses in the department, or their equivalent, are required for the major, including the senior essay. There are no prerequisites. Students develop coherent programs of study in one of two concentrations:

Concentration: Language and Civilization (depth) offers students a rigorous and intellectually coherent foundation in line with their own specific interests. Through in-depth study of Near Eastern languages and texts in their original languages, richly contextualized through study of literature, religion, visual arts, archaeology, and political and social history, students focus on the ancient Near East, the classical Near East, medieval Islam, or modern Hebrew language and culture. Requirements include: six term courses of one or two Near Eastern languages; one NELC Foundations course; four electives, chosen in consultation with the director of undergraduate studies (DUS) and assigned faculty adviser; and the senior essay.

Concentration: Languages, Civilization, and Culture (breadth) provides students the opportunity to study the Near East in its historical and cultural breadth, and to explore its rich and long-lived civilizations and cultures. This flexible program allows students to take a range of classes and to design their course of study in line with their interests. Areas of interest include languages, literature, history, religion, art and archaeology, and philosophy. Requirements include four term courses of one or more languages; two NELC Foundations courses; and five electives, including one on the ancient Near East, one on the medieval Near East, and one on the modern Middle East, chosen in consultation with the DUS and assigned faculty adviser; and the senior essay.

All students are also encouraged to take related courses in other departments and programs, such as Anthropology, Archaeology, Classics, History, History of Art, History of Science, Medicine and Public Health, Judaic Studies, Comparative

Literature, Philosophy, and Religious Studies. Such courses, including Residential College Seminars, will routinely be accepted for credit toward the major if they deal with Near Eastern topics, at the discretion of the assigned faculty adviser and the DUS.

SENIOR REQUIREMENT

The senior essay is a research paper of at least thirty pages prepared under the supervision of a departmental faculty member. It may be written under the rubric of NELC 492 and/or 493, or as an extended seminar paper in a departmental seminar course, in which case the instructor serves as the essay adviser. The topic and a prospectus signed by an adviser are to be submitted to the DUS by the end of the fourth week of classes in either term of the senior year. The particular subject matter and theoretical approach of the essay are decided by the student after consultation with the faculty adviser.

In cases in which students demonstrably need more time for an extended research paper, the senior essay may be approved as a yearlong course after consultation with the adviser and the DUS. Only those students who have advanced language skills and whose project is considered to be of exceptional promise are eligible. The requirements for the two-term essay are the same as for the one-term essay, except that the essay should be at least sixty pages.

ADVISING

All course schedules must be discussed with the assigned faculty adviser and approved by the DUS.

Languages currently offered by the Department of Near Eastern Languages and Civilizations include Akkadian, Arabic, Armenian, Egyptian, Hebrew, Ottoman Turkish, Persian, Syriac, and Turkish. Students who take a foreign language during a term, year, or summer abroad must complete a departmental placement examination after they return to Yale; there are no exceptions to this requirement.

Well-qualified students who have acquired the requisite background in undergraduate courses may, with the permission of the instructor, the DUS, and the director of graduate studies, be admitted to graduate courses where no suitable undergraduate courses exist.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior essay)

Distribution of courses *Language and Civilization concentration (depth)* – 6 term courses of up to 2 Near Eastern language courses; 1 Foundations course; and 4 electives, with DUS consultation; *Languages, Civilization, and Culture concentration (breadth)* – 4 term courses of 1 or more Near Eastern language courses; 2 Foundations courses; 5 electives to include 1 ancient, 1 medieval, and 1 modern course, with DUS consultation

Senior requirement Senior essay in NELC 492 and/or 493 or in dept seminar

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The Department of Near Eastern Languages and Civilizations offers a Certificate of Advanced Language Study in Arabic, Hebrew, and Turkish. 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, a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course, which ordinarily is an advanced seminar with an additional weekly discussion section in the target language, to count toward the 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.

Hebrew specific requirements The two required L5 courses must be modern Hebrew courses that include a speaking component.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

FACULTY OF THE DEPARTMENT OF NEAR EASTERN LANGUAGES AND CIVILIZATIONS

Professors John Darnell, Benjamin Foster, Eckart Frahm, Dimitri Gutas (*Emeritus*), Bentley Layton (*Emeritus*), Shawkat Toorawa, Kevin Van Bladel, Harvey Weiss

Senior Lectors and Senior Lecturers Sarab Al Ani, Muhammad Aziz, Jonas Elbousty, Shiri Goren, Dina Roginsky, Farkhondeh Shayesteh, Kathryn Slanski

Lectors and Lecturers Julien Cooper, Ozgen Felek, Christina Geisen, Agnete Lassen, Selim Tiryakiol, Klaus Wagensonner, Orit Yeret

Neuroscience

Directors of undergraduate studies: Damon Clark (neuroscience.dus@yale.edu) (MCDB), YSB C148; Nicholas Turk-Browne (neuroscience.dus@yale.edu) (Psychology), SSS 305; 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 101, 102, 103, and 104. All majors must also complete one of the following: PSYC 200, S&DS 103, 105, 230, 238.

PLACEMENT PROCEDURES

To join the major, students should submit a transcript and a completed Neuroscience major worksheet to the department registrar. (neuroscience.registrar@yale.edu)

REQUIREMENTS OF THE MAJOR

A minimum of 18.5 credits is required, including the three prerequisites, 15 lecture or seminar courses (which include the senior requirement), and one laboratory, as follows:

1. Two Neuroscience foundation courses, NSCI 160 and 320.
2. One Neuroscience lab chosen from NSCI 229L, 258, 260, 270, 321L.
3. Eleven electives from the following core groupings, with a minimum of: two from the Systems/Circuits/Behavior Core, two from the Molecular/Cellular/Biological Core, one from the Quantitative Core, one from the Computational Core, and one from the Basic Allied Core. No more than two credits may be taken from the Other Allied Core.

Systems/Circuits/Behavior Core: NSCI 340, 341, 346, 352, 355, 360, 440, 441, 442, 445; PSYC 238, PSYC 449

Molecular/Cellular/Biological Core: NSCI 324, 325, 420; MCDB 200, 202, 205, 210, 300, 310, 370, 450, 452; MB&B 300

Quantitative Core: MATH 112, 115, 116, 120, 222, 225, 226, 230, 231, 244, 246, 247 MATH 255, MATH 256; ENAS 151; NSCI 324, 325; CPSC 202

Computational Core: CPSC 100, 112, 201, 223, 323, 365, 470, 475, 476; ENAS 130; S&DS 123, 262, S&DS 355, 361; NSCI 453

Basic Allied Core: PHYS 170, 171, 180, 181, 200, 201, 260, 261; CHEM 161, 163, 165, 167, 174, 175, 220, 221

Other Allied Core: NSCI 141, 161, 240, 419, 455, 479; BENG 485; MCDB 250; CGSC 110; PSYC 110; one additional Neuroscience lab course from the list above

Credit/D/Fail No course taken Credit/D/Fail may be counted toward the major, including prerequisites.

Roadmap See visual roadmap of the requirements.

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 490 and 491. 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 490 and 491, students are expected to attend a semi-regular capstone seminar, to hear guest speakers and to discuss senior work progress with their peers and the directors of undergraduate studies (DUSes). 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 490 and 491, students must submit a form and the research plan with 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 480 and 481; or one credit in nonempirical research, NSCI 480 or 481, and one credit in empirical research, NSCI 490 or 491. These courses are only open to Neuroscience seniors and receive a letter grade. Under faculty supervision, for NSCI 480 or 481, 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 contribution is not adequate. Written assignments include a short research plan due at the beginning of the fall term, a literature review 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 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 is available on the program website.

ADVISING

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 this bulletin, students should contact the Neuroscience registrar.

REQUIREMENTS OF THE MAJOR

Prerequisites BIOL 101, 102, 103, and 104; and one of PSYC 200, S&DS 103, 105, 230, 238

Number of courses 18.5 credits (including prereqs and senior req)

Specific courses required 2 neuroscience foundation courses, NSCI 160 and 320

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 490 and 491; *B.A.* – 2 nonempirical research courses, NSCI 480 and 481, or 1 empirical research course (NSCI 490 or 491) and 1 nonempirical research course (NSCI 480 or 481)

FACULTY OF THE NEUROSCIENCE MAJOR

Professors †Amy Arnsten (*School of Medicine, Psychology*), Ty Cannon (*Psychology*), John Carlson (*Molecular, Cellular and Developmental Biology*), B. J. Casey (*Psychology*), Marvin Chun (*Psychology*), Paul Forscher (*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*), Laurie Santos (*Psychology*), †Dana Small (*School of Medicine, Psychology*), †Jane Taylor (*School of Medicine, Psychology*), Nick Turk-Browne (*Psychology*), Robert Wyman (*Molecular, Cellular and Developmental Biology*)

Associate Professors †Alan Anticevic (*School of Medicine, Psychology*), Arielle Baskin-Sommers (*Psychology*), Abhishek Bhattacharjee (*Computer Science*), †Sreenganga Chandra (*School of Medicine, Molecular, Cellular and Developmental Biology*), Steve Chang (*Psychology*), Damon Clark (*Molecular, Cellular and Developmental Biology*), †Philip Corlett (*School of Medicine, Psychology*), Molly Crockett (*Psychology*), Thierry Emonet (*Molecular, Cellular and Developmental Biology*), Avram Holmes (*Psychology*), †Hedy Kober (*School of Medicine, 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 Dylan Gee (*Psychology*), Maria Gendron (*Psychology*), Julia Leonard (*Psychology*), Samuel McDougale (*Psychology*), †John Murray (*School of Medicine, Physics*), Michael O'Donnell (*Molecular, Cellular and Developmental Biology*),

Priya Panda (*Electrical Engineering*), Robb Rutledge (*Psychology*), Ilker Yildirim (*Psychology*)

Lecturers Stephanie Lazzaro (*Psychology*)

Philosophy

Director of undergraduate studies: Daniel Greco (daniel.greco@yale.edu) [Sp 2021]; Paul Franks (paul.franks@yale.edu) [Fall 2021, Sp 2022]; (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 aim of the major is 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.

COURSES FOR NONMAJORS AND MAJORS

Introductory philosophy courses, numbered 001–199, are open to all students and have no prerequisites.

COURSE NUMBERING

Courses numbered 001–199 are introductory and have no prerequisites. Courses numbered 200–399 are intermediate. 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 400–499 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

The Philosophy curriculum is divided into three broad groups: history of philosophy; metaphysics and epistemology; and ethics and value theory. The group in 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 also search for courses satisfying a given group requirement in YCS by clicking the drop-down menu titled, "Any Course Information Attribute." Students have the following choices: YC Phil: Ethics & Value Theory, YC Phil: History of Philosophy, YC Phil: Metaphysics & Epistemology, as well as YC Phil: Logic and YC Phil: Psychology Track.

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 history of philosophy, majors are required to take (1) either PHIL 125 and 126 or both terms of Directed Studies (DRST 003, 004), and (2) an additional, third course in history of philosophy. Majors are encouraged to take PHIL 125 and 126 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 115), the last preferably by the fall of their junior year. Majors must also take two advanced seminars at the 400 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 125 and 126 or DRST 003 and 004, (2) a course in logic, such as PHIL 115, 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 110 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 towards the philosophy major. Courses taken Credit/D/Fail cannot fulfill any specific distribution requirements within the major – they cannot fulfill the area requirements, or the seminar requirement, or 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.

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 490, 491). 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 advisor – which should be done by the first of October in the junior year – but all seniors are advised by the DUS. The advisor aids students in choosing courses and signs their schedules during the course selection period.

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.

REQUIREMENTS OF THE MAJOR

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 125 and 126, or DRST 003 and 004; *Psychology concentration* – PSYC 110 or equivalent

Distribution of courses *Standard major* – 3 courses in hist of phil (incl PHIL 125 and 126, or DRST 003 and 004), 2 in metaphysics and epistemology, 2 in ethics and value theory, and 1 in logic; 2 phil sems at 400 level; *Psychology concentration* – 7 courses in phil, as specified; 5 courses in psych

Substitution permitted *Standard major* – 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 490, 491)

FACULTY OF THE DEPARTMENT OF PHILOSOPHY

Professors David Charles, Stephen Darwall, Michael Della Rocca, Keith DeRose, Paul Franks, Tamar Gendler, John Hare, Verity Harte, Brad Inwood, Shelly Kagan, Joshua Knobe, Thomas Pogge, Scott Shapiro, Sun-Joo Shin, Steven Smith, Jason Stanley, Zoltán Szabó, Kenneth Winkler, Gideon Yaffe

Associate Professors Daniel Greco, John Pittard

Assistant Professors Robin Dembroff, Manon Garcia

Physics

Director of undergraduate studies: Nikhil Padmanabhan

(nikhil.padmanabhan@yale.edu), Thomas Mellon Evans Hall, Rm. 207, 56 Hillhouse Ave., 432-9950; 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 469, 470, 471, and 472) 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 469 and PHYS 470, introductory research courses, are open to all students. Juniors and seniors, as part of the senior requirement, are required to enroll in PHYS 471 and 472—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 120 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 170, 171 is aimed at students who are interested in the biological sciences or medicine. Knowledge of differential and integral calculus at the level of MATH 112

- or equivalent is a prerequisite. MATH 115 or (preferably) MATH 116 should be taken concurrently with PHYS 171. PHYS 170 is a prerequisite for PHYS 171.
- PHYS 180, 181 is aimed at students who plan to major in the physical sciences or engineering. Calculus at the level of MATH 112 is a prerequisite; MATH 115 and 120 should be taken concurrently. PHYS 180 or PHYS 200 is a prerequisite for PHYS 181.
 - PHYS 200, 201 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 115 is presumed; MATH 120 and either MATH 222, 225, or 226, which are generally taken concurrently.
 - PHYS 260, 261 is intended for students who have had excellent prior training in mathematics and a solid foundation in physics. One of MATH 120, ENAS 151, PHYS 301, or the equivalent should be taken concurrently with PHYS 260, 261.

Introductory laboratories Two different introductory laboratory sequences are offered: PHYS 165L, 166L, and PHYS 205L, 206L. 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.

- PHYS 165L, 166L is an introductory laboratory sequence aimed at students interested in engineering, the life sciences, and medicine. Related lecture courses are PHYS 170, 171, and PHYS 180, 181.
- PHYS 205L, 206L is for students who plan to major in the physical sciences or engineering. Related lecture courses are PHYS 180, 181; PHYS 200, 201; and PHYS 260, 261. Students who take the lecture courses in their first year are advised to start this laboratory sequence with PHYS 205L in the spring of their first year or in the fall of sophomore year.

Advanced electives A series of 340-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 170, 171; or 180, 181; or 200, 201; or 260, 261). Physics courses more advanced than PHYS 290 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 170, 171 with MATH 112, 115; or PHYS 180, 181 with MATH 115, 120; or PHYS 200, 201 with MATH 120 and either 222 or 225 or 226; or PHYS 260, 261 with MATH 120, ENAS 151, PHYS 301, or equivalent. In addition, the laboratory sequence PHYS 205L, 206L or PHYS 165L, 166L 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

B.S. degree program Eight courses are required beyond the prerequisites, including the senior project. Students must take a mathematics course at the level of, or more advanced than, PHYS 301. Three courses at the core of the major, PHYS 401, 402, and either PHYS 439 or 440, involve advanced study of fundamental topics common to all branches of physics. PHYS 401 and 402 pertain to advanced classical physics (mechanics, statistical physics and thermodynamics, and electromagnetism), while the third, PHYS 439 or 440 covers quantum mechanics. PHYS 401 must be taken before PHYS 402, 439, or 440.

Three advanced elective courses are also required. Suitable advanced courses are numbered higher than PHYS 290, such as the advanced laboratory PHYS 382L, and 400-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 courses are required beyond the prerequisites, including the senior project. Students must take a mathematics course at the level of, or more advanced than, PHYS 301. 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 410), statistical physics and thermodynamics (PHYS 420), and electromagnetism (PHYS 430). Two other courses incorporate quantum mechanics (PHYS 440 and 441). Because the ideas build progressively: PHYS 410 must precede PHYS 440; PHYS 430 and 440 must precede PHYS 441, and PHYS 440 must also precede PHYS 420.

Because experiment is at the heart of the discipline, the intensive major requires one term of advanced laboratory (PHYS 382L or equivalent) and at least two terms of independent research (PHYS 471, 472 or equivalent). One advanced elective course is required to complete the program. Suitable advanced courses are more advanced than PHYS 290 and include 400-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 ten advanced courses.

Credit/D/Fail courses Courses taken Credit/D/Fail may not be counted toward the requirements of either major.

Roadmap See visual roadmap of the requirements.

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 471 or 472 or equivalent. One enrollment of PHYS 471 or 472 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 in PHYS 471 or 472. Two enrollments of PHYS 471 or 472 taken at any time during junior or senior year counts as the senior requirement for the intensive Physics major. Students may take either PHYS 471 or 472 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 170, 171, or 180, 181, or 200, 201, or 260, 261	PHYS 206L	PHYS 439 or PHYS 440
PHYS 205L	PHYS 301	PHYS 471 or 472
Mathematics corequisites	PHYS 401	Two advanced electives
	PHYS 402	
	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 170, 171, or 180, 181, or 200, 201, or 260, 261	PHYS 206L	PHYS 441
PHYS 205L	PHYS 301	PHYS 420
Mathematics corequisites	PHYS 410	PHYS 430
	PHYS 440	PHYS 471
	PHYS 382L	PHYS 472
		One advanced elective

REQUIREMENTS OF THE MAJOR

B.S. DEGREE

Prerequisites PHYS 170, 171 or 180, 181 or 200, 201 or 260, 261, with appropriate math coreqs, as indicated; PHYS 205L, 206L or PHYS 165L, 166L

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

Specific courses required PHYS 401, 402, and either PHYS 439 or 440, as indicated

Distribution of courses PHYS 301 or other advanced math course; 3 advanced electives approved by DUS

Senior requirement PHYS 471 or 472 or equivalent

B.S. DEGREE, INTENSIVE MAJOR

Prerequisites PHYS 170, 171 or 180, 181 or 200, 201 or 260, 261, with appropriate math coreqs, as indicated; PHYS 205L, 206L or PHYS 165L, 166L

Number of courses 10 term courses beyond prereqs (incl senior req)

Specific courses required PHYS 410, 440, 441, 420, 430, as indicated; PHYS 382L or equivalent

Distribution of courses PHYS 301 or other advanced math course; 1 advanced elective approved by DUS

Senior requirement two terms of PHYS 471 or 472

FACULTY OF THE DEPARTMENT OF PHYSICS

Professors †Charles Ahn, Yoram Alhassid, Thomas Appelquist, †Charles Bailyn, O. Keith Baker, Charles Baltay, Sean Barrett, Helen Caines, †Hui Cao, Richard Casten (*Emeritus*), †Paolo Coppi, †Michel Devoret, †Thierry Emonet, Bonnie Fleming, †Marla Geha, Steven Girvin, Larry Gladney, Leonid Glazman, Jack Harris, John Harris (*Emeritus*), Karsten Heeger (*Chair*), †Victor Henrich (*Emeritus*), †Joe Howard, Francesco Iachello (*Emeritus*), †Sohrab Ismail-Beigi, Steve Lamoreaux, Simon Mochrie, Vincent Moncrief, †Priyamvada Natarajan, †Corey O'Hern, Peter Parker (*Emeritus*), †Daniel Prober, Nicholas Read, †Peter Schiffer, †Robert Schoelkopf, 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 †Damon Clark, Sarah Demers, Walter Goldberger, Reina Maruyama, †Michael Murrell, Daisuke Nagai, Nikhil Padmanabhan, David Poland, †Peter Rakich, Alison Sweeney

Assistant Professors Meng Cheng, Eduardo Higino da Silva Neto, Benjamin Machta, David Moore, †John Murray, Nir Navon, Laura Newburgh, †Diana Qiu

Senior Lecturers Sidney Cahn, Adriane Steinacker

Lecturers Mehdi Ghiassi-Nejad, Stephen Irons, Rona Ramos

†A joint appointment with primary affiliation in another department.

Physics and Geosciences

Directors of undergraduate studies: Nikhil Padmanabhan (nikhil.padmanabhan@yale.edu) (Physics), 207 Thomas Mellon Evans Hall, 56 Hillhouse Ave., 432-9950; Mary-Louise Timmermans (mary-louise.timmermans@yale.edu) (Earth and Planetary Sciences), 111 KGL, 432-3167

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 120 or its equivalent, PHYS 170, 171 or another introductory physics sequence, the associated physics laboratory sequence PHYS 205L, 206L, and a course in ordinary differential equations chosen from ENAS 194, MATH 246, or PHYS 301.

REQUIREMENTS OF THE MAJOR

Beyond the prerequisites, the major requires twelve term courses (13 term courses if the EPS introductory course has an accompanying laboratory), including the senior project. At least four of these courses must be in Physics and at least six must be in Earth and Planetary Sciences. Students complete a two- or three-term advanced physics sequence: either PHYS 401 and 402, or PHYS 410, 420, and 430. They must also take basic quantum mechanics (PHYS 439 or PHYS 440) and one elective numbered PHYS 290 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 100–140, with any accompanying laboratory; one elective numbered EPS 200 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 Physics and Geosciences major, including prerequisites.

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 471, 472 or EPS 490, 491. In addition, students must present an oral report on their project to each department.

ADVISING

Interested students should consult the directors of undergraduate studies (DUSes) in Physics and in Earth and Planetary Sciences.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 120 or equivalent; PHYS 170, 171 or above; PHYS 205L, 206L; ENAS 194, MATH 246, or PHYS 301

Number of courses At least 12 courses beyond prereqs, incl senior req

Specific courses required PHYS 401 and 402, or PHYS 410, 420, and 430; PHYS 439 or PHYS 440

Distribution of courses 1 elective numbered PHYS 290 or above; 1 intro course in EPS, with lab, as specified; 1 elective course numbered EPS 200 or above; 4 advanced courses in a 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 471, 472 or EPS 490, 491, on topic acceptable to both depts; oral report on project to both depts or equivalent

Physics and Philosophy

Directors of undergraduate studies: Nikhil Padmanabhan

(nikhil.padmanabhan@yale.edu) (Physics), 207 Thomas Mellon Evans Hall, 56 Hillhouse Ave., 432-9950; Daniel Greco (daniel.greco@yale.edu) (Philosophy), 106A Connecticut Hall, 432-1687

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 120; any introductory Physics lecture sequence numbered 170 or higher; PHYS 165L and 166L, or 205L and 206L.

REQUIREMENTS OF THE MAJOR

Beyond the prerequisites, students take fourteen term courses, including the senior requirement. Seven courses in Physics approved by the director of undergraduate studies (DUS) and numbered 295 or higher are required, including PHYS 301 or equivalent and either PHYS 439 or 440. Six courses in Philosophy or in History of Science, Medicine, and Public Health are required, including PHIL 125 and 126, one course in logic above the introductory level, and a Philosophy seminar selected with the approval of the DUSes.

SENIOR REQUIREMENT

B.S. degree program Seniors must complete PHYS 471 or 472 (independent project).

B.A. degree program Seniors must complete one of the following: (1) PHIL 490 or 491 (senior essay); (2) PHIL 480 (tutorial) on an appropriate subject; (3) an appropriate Philosophy seminar with the approval of the DUS in Philosophy.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 120; PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261; PHYS 165L, 166L, or 205L, 206L

Number of courses 14 term courses beyond prereqs, incl senior req

Specific courses required PHYS 301 or equivalent; PHYS 439 or 440; PHIL 125, 126

Distribution of courses 7 Physics courses numbered 295 or higher approved by DUS; 6 courses in PHIL or HSHM, incl 1 in logic above intro level and a PHIL sem, as specified

Senior requirement B.S. – PHYS 471 or 472; B.A. – PHIL 490 or 491, PHIL 480 on appropriate topic, or approved PHIL sem

Political Science

Director of undergraduate studies: David Simon (david.simon@yale.edu), 115 Prospect St., 432-5236; 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

The standard B.A. degree program Twelve term courses in political science are required. Students must take at least two courses in each of any three of the department's five fields – international relations, American government, political philosophy, analytical political theory, and comparative politics. Students expecting to major in Political Science are encouraged to take one or more introductory-level courses in the department early in their college careers. Introductory courses count toward the overall course requirement and toward the departmental fields requirement.

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 director of undergraduate studies (DUS), count one term of DRST 005 or DRST 006 toward the major.

The standard B.A. degree program, interdisciplinary concentration Students majoring in Political Science may choose an interdisciplinary concentration, which allows them 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.

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 gives students an opportunity 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 474 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 490 and PLSC 493 (PLSC 490 also counts toward the senior seminar requirement); (3) a total of fifteen term courses is required.

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 major, which will count as non-A grades for purposes of calculating Distinction in the Major. Seminars taken Credit/D/F will not count toward the major requirements, but will count as non-A grades for purposes of calculating Distinction in the Major.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

Seniors in the major must complete a senior essay. The essay can be written either in one term or over both terms of the senior year. In order to graduate from Yale College, a student majoring in Political Science must achieve a passing grade on the senior essay. The senior requirement for the standard B.A. degree program with an interdisciplinary concentration is the same as for the standard program, with the provision that the essay must be written on a subject that falls within the field of concentration.

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 course work, 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 beginning of the term in which the essay is written, 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 480. 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 490 and 491. Both classes are offered in both terms, but must be taken in order. PLSC 490 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 admission in their junior year. By the appropriate date, students should submit to the office of the DUS: (1) the yearlong senior essay prospectus form signed by a faculty adviser who has agreed to supervise the student during both terms of the senior year; and (2) a one-page statement describing the research project. Due to space constraints in PLSC 490, it is expected that no more than fifteen students will be admitted each term.

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. Majors must secure written approval of their course selections each term from the DUS. All subsequent changes in a student's major program must also be approved. 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 K, Special 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 a junior term abroad program or at another university during the summer 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.

REQUIREMENTS OF THE MAJOR

B.A. DEGREE, STANDARD PROGRAM

Prerequisites None

Number of courses *Standard major* – 12 term courses; *intensive major* – 15 term courses

Distribution of courses 2 courses in each of 3 of the 5 departmental fields; 2 PLSC sems, 1 in senior year

Substitution permitted 2 courses from other depts with DUS approval

Senior requirement 1-term senior essay in sem or in PLSC 480; or 2-term senior essay in PLSC 490, 491

Intensive major PLSC 474 in spring term of junior year; 2-term senior essay in PLSC 490, 493

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 courses in each of 2 of the 5 departmental fields; 2 PLSC sems, 1 in senior year

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 480; or 2-term senior essay in PLSC 490, 491; both options on subject within concentration

Intensive major PLSC 474 in spring term of junior year; 2-term senior essay in PLSC 490, 493 on subject within concentration

FACULTY OF THE DEPARTMENT OF POLITICAL SCIENCE

Professors Bruce Ackerman, Akhil Amar, Seyla Benhabib (*Emeritus*), Paul Bracken, David Cameron (*Emeritus*), Benjamin Cashore, Bryan Garsten, Alan Gerber, Jacob Hacker, Oona Hathaway, Daniel HoSang, Gregory Huber, Isabela Mares, David Mayhew (*Emeritus*), Gerard Padro i Miquel, Doug Rae (*Emeritus*), John Roemer, Susan Rose-Ackerman (*Emeritus*), Frances McCall Rosenbluth, Bruce Russett (*Emeritus*), Kenneth Scheve, James Scott (*Emeritus*), Jasjeet Sekhon, Ian Shapiro, Stephen Skowronek, Steven Smith, Milan Svolik, Peter Swenson, Edward Tufte (*Emeritus*), Ebonya Washington, Steven Wilkinson, Elisabeth Wood

Associate Professors Peter Aronow, Katharine Baldwin, Sarah Bush, Ana De La O, Alexandre Debs, Hélène Landemore, Nuno Monteiro, Kelly Rader

Assistant Professors Alexander Coppock, Allison Harris, John Henderson, Joshua Kalla, Sarah Khan, Christina Kinane, Egor Lazarev, Daniel Mattingly, Salma Mousa, Elizabeth Nugent, Giulia Oskian, Tyler Pratt, Didac Queralt, Lucia Rubinelli, Fredrik Sävje, Emily Sellars, Ian Turner

Senior Lecturers Boris Kapustin, Stephen Latham, David Simon

Lecturers Elizabeth Acorn, Andrea Aldrich, Paris Aslanidis, Leanna Barlow, Scott Bokemper, Federico Brandmayr, Andrew Bridy, John Dearborn, John DeStefano,

Amir Fairdosi, Michael Fotos, Greg Collins, Karen Goodrow, Thomas Graham,
Maria Jose Hierro, Jane Karr, Robin Landis, Mordechai Levy-Eichel, Joanne Lipman,
Nicholas Lotito, Itumeleng Makgetla, Renata Mustafina, Nilakshi Parndigamage, Tiago
Peterlevitz, Joan Ricart-Huguet, Alexander Rosas, Vishvini Sakthivel, Walter Shapiro,
Gordon Silverstein, Daniel Tavana, Bonnie Weir, Jacob Weisberg, 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.

PREREQUISITES

Students begin the study of Portuguese with PORT 110, 125, 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 130 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 whatsoever. The departmental placement test covers reading, writing, speaking, and listening skills. See the department website for placement test times and details.

REQUIREMENTS OF THE MAJOR

The requirements of the Portuguese major consist of ten term courses beyond the prerequisites. 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).

SENIOR REQUIREMENT

All majors must present a senior essay. The essay is written in PORT 491 and/or 492. A maximum of two credits counts 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.

REQUIREMENTS OF THE MAJOR

Prerequisite PORT 130 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 from study abroad

Senior requirement Senior essay (PORT 491 and/or 492)

CERTIFICATE OF ADVANCED LANGUAGE STUDY

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 their chosen language, at least two of which must be Yale courses designated as L5. Additionally, at least one of the courses must be a 300-level course (advanced undergraduate lecture or seminar) with course materials read in Portuguese and course work written in Portuguese. 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, 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 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.

FACULTY OF THE DEPARTMENT OF SPANISH AND PORTUGUESE

Professors Rolena Adorno, Roberto González Echevarría, Aníbal González, K. David Jackson, Noël Valis, Jesús R. Velasco (*Chair*)

Senior Lectors II Sybil Alexandrov, Margherita Tortora, Sonia Valle

Senior Lectors I 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, Virginia Santos, Terry Seymour, María M. Vázquez

Lectors Carolina Baffi, Luna Nájera, Giseli Tordin

Psychology

Directors of undergraduate studies: BJ Casey (bj.casey@yale.edu) [Spring 2021]; Jutta Joormann (jutta.joormann@yale.edu) [Fall 2021, Spring 2022], 205 K, 432-0699; 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 from 120–190 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 200–209 focus on statistics. Courses numbered from 210–299 teach general methodology or data collection in various areas of psychology. Courses numbered from 300–399 are more advanced courses in a particular specialization. Senior seminars, whose enrollment is limited to twenty students, are numbered from 400–489. These seminars are best taken once a student has appropriate background. Courses numbered from 490–499 are special tutorial courses that require permission of the adviser and the director of undergraduate studies (DUS).

PREREQUISITE

PSYC 110, a general survey course, is prerequisite to several 100-level and all 200-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

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 110, including the senior requirement.

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 140, 150, 180

Social science (YC PSYC: Social Science): PSYC 125, 126, 127, 128, 140, 141, 150, 157, 165, 180, 181, 182, 250, 280L, 308, 313, 315, 326, 328, 330, 334, 342, 355

Natural science core (YC PSYC: Natural Science Core): PSYC 120, 130, 135, 160

Natural science (YC PSYC: Natural Science): PSYC 120, 130, 135, 160, 161, 171, 179, 229L, 260, 303, 307, 316, 317, 318, 321, 322, 327, 331, 335, 350, 352, 371, PSYC 372, 376

2. Because statistical techniques and the mode of reasoning they employ are fundamental in psychology, a course in statistics (PSYC 200) is required, preferably prior to the senior year. A student may substitute S&DS 103 for PSYC 200 or may substitute an examination arranged with the instructor of PSYC 200 for the course requirement. Students may take the examination only one time, and an additional course in psychology should be taken if the examination substitutes for PSYC 200. A student who has taken S&DS 103 may not take PSYC 200 for credit.
3. To assure some direct experience in collecting and analyzing data, students must elect at least one course, preferably prior to the senior year, in which research is planned and carried out. Courses numbered between 210–299 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 students should consult with the DUS in Psychology about selecting outside courses.

Students interested in research are encouraged to take an independent study course (PSYC 493) as early as the sophomore year. Students may also take PSYC 495 for one-half course credit of independent research per term with prior permission of the faculty adviser and the DUS. To obtain permission, download the tutorial form from the department website, and submit it by the seventh calendar day before classes begin. These independent study courses are graded P/F. No more than a total of three credits from PSYC 490–499 combined may count toward the major.

Neuroscience track Students with a major interest in neuroscience may wish to elect the neuroscience track. 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 meet with the track adviser, B.J. Casey (bj.casey@yale.edu), 414D SSS, 432-7790. Majors in the neuroscience track meet with the track adviser at the beginning of each term in their junior and senior years.

Requirements for the neuroscience track 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 101104. 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 160 or 170 and a data-collection course (YCS attribute: YC PSYC: NSCI Track Rsrch Mthds) chosen from PSYC 230, 238, 250, 258 or 270. PSYC 229L, 260 or MCDB 320 may substitute for the PSYC 160 or 170 requirement, or MCDB 320 and 321L may substitute for the PSYC 229L or 260 requirement, but not both. If MCDB 320 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 track must take two courses from the social science list above, at least one of which must be designated as Core in the course listings. Students in the neuroscience track 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 (YCS attribute: YC PSYC: NSCI Track Adv Scie) must be chosen from Molecular, Cellular, and Developmental Biology and Ecology and Evolutionary Biology courses numbered 200 and above that deal with human and/or animal biology; recommended courses include MCDB 200, 202, 205, 210, 250, 300, 315, 320, E&EB 220, 225, and 240. Certain courses outside of these departments may also meet the advanced science requirement, including BENG 350, 421, CPSC 475, MB&B 300, 301, 420, 435, 443, 452, MATH 222, 225, 230, 231, and 241. Other courses may qualify for this requirement with permission of the neuroscience track 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 term courses taken Credit/D/Fail may be applied toward the major; no 200-level course taken Credit/D/Fail may be applied toward the major.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

Standard major Majors are required to earn two course credits from courses numbered PSYC 400–499. At least one of these courses (excluding PSYC 490–495, 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 499 during senior year. An empirical research project normally includes designing an experiment and collecting and analyzing the data.

Neuroscience track The senior requirement for the neuroscience track is the same as for the standard major, except that the two required course credits from PSYC 400–499 must have neuroscience content (PSYC 419, 420, 428, 431, 432, 437, 449, 479, 493, 495, as well as any courses listed in YCS with the attribute, YC PSYC: NSCI Track Senior Sem). Students pursuing the B.S. degree in the track must carry out a neuroscientific

empirical project in PSYC 499 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 track adviser.

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.

ADVISING

Schedules for all majors must be discussed with, and approved by, the DUS or the adviser for the neuroscience track in Psychology. Only then may a schedule be submitted to the residential college dean's office. 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 track, students should consult with the adviser for the neuroscience track 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.

REQUIREMENTS OF THE MAJOR

STANDARD MAJOR

Prerequisite PSYC 110

Number of courses 12 courses beyond prereq (incl senior req)

Specific course required PSYC 200

Distribution of courses *B.A.* or *B.S.* – 2 social science courses and 2 natural science courses, as specified; 1 course numbered PSYC 210–299

Substitution permitted For PSYC 200, S&DS 103 or exam arranged with instructor; up to 3 relevant courses in other depts, with DUS permission

Senior requirement *B.A.* – 1 course credit from PSYC 400–489 or 499 taken during senior year; 1 additional course credit from PSYC 400–499; *B.S.* – PSYC 499 taken during senior year; 1 additional course credit from PSYC 400–499

NEUROSCIENCE TRACK

Prerequisite PSYC 110

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 101–104 unless students place out; PSYC 160 or 170; PSYC 200; PSYC 229L, 230, 238, 250, 258 or 270.

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 320 for PSYC 160 or 170; or MCDB 320 and 321L for PSYC 229L, 230 or 260; S&DS 103 or exam arranged with instructor for PSYC 200

Senior requirement *B.A.* – 1 course credit from PSYC 400–489 or 499 with neuroscience content taken during senior year; 1 additional course credit from PSYC 400–499 with neuroscience content; *B.S.* – PSYC 499 taken during senior year, with neuroscience content in a research project; 1 additional course credit from PSYC 400–499 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

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: EPH 505, Biostatistics in Public Health; EPH 507, Social Justice and Health Equity; EPH 508, Foundations of Epidemiology and Public Health; EPH 515, Ethics and Public Health: An Introduction; EPH 510, Health Policy and Health Care Systems, and EPH 513, Major Health Threats: Determinants and Solutions.

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), a personal statement, and approval from the student's residential college dean. 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.

Religious Studies

Director of undergraduate studies: Travis Zadeh, (travis.zadeh@yale.edu) 420 York Street, 432-6532; religiousstudies.yale.edu

The Religious Studies curriculum approaches the history of human thought and practice while focusing on specific geographical, cultural, and philosophical areas of scholarly interest. Courses explore when, how, and why communities forge systems of value. Faculty guide students to examine institutions, practices, texts, and ideas simultaneously: to see how texts influence institutions, how institutions prescribe habits, and how human beings resist and reevaluate the given institutions and practices of their specific geographic and historical contexts. The Religious Studies department is particularly known for its promotion of scholarly research by undergraduates. Undergraduate majors acquire the linguistic, philosophical, and historical acumen necessary for an in-depth research project during their senior year.

COURSE NUMBERING

Religious Studies course offerings, other than First-Year Seminars, are arranged in four categories. Group A (course numbers 100-119) features general and comparative courses that engage more than one tradition, concept, or text. Group B (course numbers 120-174) includes survey courses that provide a broad introduction to a particular religious tradition or scripture in historical context. Group C (course numbers 175-399) includes courses on specialized topics in religious studies, both introductory and intermediate. Group D (course numbers 400-499) offers advanced courses on specialized topics which typically have specific prerequisites or require the permission of the instructor. Students who want a broad introduction to the study of religions can choose courses listed under Groups A or B, though courses listed under Group C are also open without prerequisite. Religious Studies majors develop specialized concentrations as they plan a major program in consultation with the director of undergraduate studies (DUS) and other members of the faculty.

REQUIREMENTS OF THE MAJOR

The department offers two programs for students majoring in Religious Studies: the standard major and a major in which religious studies is combined with another subject closely related to the senior essay. Both programs require a core of six courses, a seminar, and a two-term senior essay.

Core requirement A core of six courses in Religious Studies is required of all majors and should be selected in consultation with the DUS. Students select one core course from Group A that involves the comparative study of religions and three core courses from Groups B and C that concentrate on the historical or textual study of three different religious traditions or regions. Students are encouraged to select religions and regions as widely divergent as possible in order to balance in-depth study with global diversity and connection. One core course must focus on systematic thought (ethics, philosophy, or theology). The final core course is RLST 490, Religion and Society, the junior seminar on the academic study of religion; this course is required for all majors.

Seminar requirement Before the end of the junior year, students must complete a seminar (in addition to the junior seminar) that requires a major research paper. In Program I, this seminar must be an elective in Religious Studies. In Program II, it

may be a course in Religious Studies, or it may constitute one of the four term courses outside the department.

Program I. The standard major Program I consists of twelve term courses in Religious Studies, including the core of six required courses, the two-term senior essay, and four electives. The electives are usually selected from Groups C and D and form a coherent unit to help the student prepare for the senior essay. Certain cognate courses in other departments that are integral to the student's area of concentration may count toward the major with permission of the DUS. Normally the maximum number of cognate courses that may be applied is two. Two terms of an ancient language related to the study of religion may, with permission of the DUS, be counted.

Program II. Religious studies with another subject Program II consists of eight term courses in Religious Studies (the core of six required courses and the two-term senior essay) and four term courses outside the department, one of which may fulfill the seminar requirement outlined above. The four courses outside the department need not directly concern religion, but they must form a coherent, focused unit of concentration. Through them students can develop expertise in a methodological approach, cultural area, historical period, or body of literature contributing to the senior essay. Examples of successful combinations might be: four courses in Chinese history, language, and literature with a senior essay topic on Chinese Buddhism; four courses in early American history and literature with a topic on colonial American religion; four courses in a specific area of biology and medical science with a topic on biomedical ethics; or four courses in globalization and international relations with a topic on religion and globalization. Each student's petition to take this program will be judged on its contribution to the student's senior essay. Normally, introductory courses in other departments may not count among the outside courses; appropriate language courses at a higher level may. Students electing Program II must, at the end of the junior year and in no case later than the beginning of the senior year, obtain approval for their proposed program from the DUS. Students who think they may elect this program should consult the DUS as early as possible in their studies to begin suitable selection of courses.

SENIOR REQUIREMENT

Students in both programs must write a senior essay under the supervision of a faculty adviser in the student's area of concentration. In selecting a senior essay topic, students normally choose a subject on which they have completed course work before commencing the senior year. The essay counts as two term 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 course, RLST 491 and 492, includes research and writing assignments as well as colloquia in which seniors present and discuss their research. The student must 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific course required RLST 490 (one of the core courses)

Distribution of courses *Both programs*—5 remaining core courses to include: 1 course in comparative religions; 3 courses in historical or textual study of religious traditions or regions, as specified; 1 course in systematic thought, as specified; *Program I*—4 electives, one of which is a seminar, as specified; *Program II*—4 non-introductory courses in another subject linked with the senior essay, one of which is a seminar, approved by DUS

Substitution permitted *Both programs*—Divinity School courses, with DUS permission; *Program I*—2 related courses in other depts, with DUS permission

Senior requirement Senior essay (RLST 491, 492)

FACULTY OF THE DEPARTMENT OF RELIGIOUS STUDIES

Professors Stephen Davis, Carlos Eire, Steven Fraade, Paul Franks, Bruce Gordon, Philip Gorski, Frank Griffel, John Hare, Christine Hayes, Noel Lenski, Nancy Levene, Kathryn Lofton, Ivan Marcus, Laura Nasrallah, Sally Promey, Shawkat Toorawa

Associate Professors Zareena Grewal, Noreen Khawaja, Hwansoo Kim, Eliyahu Stern, Travis Zadeh

Assistant Professors Maria Doerfler, Supriya Gandhi, Eric Greene, Nicole Turner

Senior Lecturers John Grim, Margaret Olin, Mary Evelyn Tucker

Lecturers Jimmy Daccache, Stephen Latham

Russian

Director of undergraduate studies: Jinyi Chu, (jinyi.chu@yale.edu) HQ 542, 320 York Street, 432-1302; language coordinator: Irina Dolgova, (irina.dolgova@yale.edu) HQ 538, 320 York Street, 432-1307; 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, Irina Dolgova (irina.dolgova@yale.edu), to schedule the oral placement exam or for information about preregistration. She may be reached via email or at 432-1307.

Students in the Class of 2022 and 2023 With approval from the director of undergraduate studies (DUS), the following changes to the prerequisites and requirements of the major may be fulfilled by students who declared their major under previous requirements.

Students in the Class of 2024 and subsequent classes follow the requirements as indicated.

PREREQUISITES

Prerequisite to the major in both programs is second year Russian, RUSS 140, 142, 145, or S140. The department offers three sequences of language courses to fulfill the prerequisite: either (1) RUSS 110, 120, 130, 140, or (2) RUSS 125, 145 or (3) courses for heritage speakers, RUSS 122, 142. 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 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 150 and 151.
2. Fourth-year Russian: RUSS 160 and 161.
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. First-Year Seminars and courses number 200 or higher fulfill this requirement.

4. One content course in which Russian is the language of instruction (RUSS 170–190).
5. One course in Russian, East European, or Eurasian history or social sciences.
6. RUSS 490. 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 DUS approval.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

SENIOR REQUIREMENT

All majors write a senior essay (RUSS 490), an independent project carried out under the guidance of a faculty member. 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. By the third Friday of October, majors submit a detailed prospectus of the essay, with bibliography, to the adviser. A draft of at least ten pages of the text of the essay, or a detailed outline of the entire essay, is due to the adviser by the last day of reading period of the fall semester. The senior essay takes the form of a substantial article, no longer than 13,000 words, excluding footnotes and bibliography. The final essay is due on April 9, 2022. A member of the faculty other than the adviser grades the essay.

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 in the Russian Federation 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 Russia in approved programs may substitute for certain advanced Russian courses at Yale. Students interested in study abroad should consult the DUS well before their junior year. Students can apply for FLAS and Fox fellowships to support their travel.

REQUIREMENTS OF THE MAJOR

Prerequisite RUSS 140, 142, 145, S140 or placement exam

Number of courses 11 term courses beyond prereq (incl senior essay)

Specific courses required RUSS 150, 151, 160, 161

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 490)

CERTIFICATE OF ADVANCED LANGUAGE STUDY

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 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 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 151, 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, a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may allow one "language across the curriculum" (LxC) course, which ordinarily is an advanced seminar with an additional weekly discussion section in the target language, to count toward the 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 those courses appear on their transcript.

Credit/D/Fail No courses taken Credit/D/Fail may be counted toward the requirements of the certificate.

FACULTY OF THE DEPARTMENT OF SLAVIC LANGUAGES AND LITERATURES

Professors Edyta Bojanowska (*Slavic Languages and Literatures*), Katerina Clark (*Comparative Literature, Slavic Languages and Literatures*), John MacKay (*Film & Media Studies, Slavic Languages and Literatures*)

Associate Professor Molly Brunson (*Slavic Languages and Literatures*)

Assistant Professors Marijeta Bozovic (*Slavic Languages and Literatures*), Jinyi Chu (*Slavic Languages and Literatures*), Claire Roosien (*Slavic Languages and Literatures*)

Senior Lectors II Irina Dolgova (*Slavic Languages and Literatures*), Constantine Muravnik (*Slavic Languages and Literatures*)

Senior Lectors I Krystyna Illakowicz (*Slavic Languages and Literatures*), Julia Titus (*Slavic Languages and Literatures*), Karen von Kunes (*Slavic Languages and Literatures*)

Russian, East European, and Eurasian Studies

Director of undergraduate studies: Jinyi Chu (jinyi.chu@yale.edu), HQ 542, 320 York St., 432-1302; language coordinator: Irina Dolgova (irina.dolgova@yale.edu), HQ 538, 320 York St.; slavc.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, Irina Dolgova (irina.dolgova@yale.edu), to schedule the oral placement exam or for information about preregistration. She may be reached via email or at 432-1307. Entering first-year students who have some knowledge of Czech or Polish should contact Krystyna Illakowicz (krystyna.illakowicz@yale.edu) (Polish) or Karen von Kunes (karen.vonkunes@yale.edu) (Czech) to arrange to take a brief placement examination.

Students in the Class of 2022 and 2023 With approval from the director of undergraduate studies (DUS), the following changes to the prerequisites and requirements of the major may be fulfilled by students who declared their major under previous requirements.

Students in the Class of 2024 and subsequent classes follow the requirements as indicated.

PREREQUISITES

Russian Studies concentration Completion of Second-Year Russian (RUSS 140, 142, 145 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 so students are encouraged to learn more than one language.

Russian Studies concentration Twelve term courses 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 490 or 491). To fulfill the language requirement students must demonstrate a proficiency in Russian by completing RUSS 150 and 151 or by passing an equivalency exam. A maximum of five language courses may be counted toward the major. If language proficiency is met without course work, 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 160 and 161, a content course taught in Russian at the 170–190 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 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, Finnish, 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 course work, the course requirements must be fulfilled through additional term courses to bring the overall total to eleven courses.

Credit/D/Fail Course taken Credit/D/Fail may not be counted toward the requirements of the major.

SENIOR REQUIREMENT

Every major must write a one-term senior essay in RSEE 490 or 491. By the end of the junior year, students should declare their general topic and confirm 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. With the permission of the DUS and senior essay adviser, a student may choose a two-semester senior essay project in the RSEE major, which must be approved by the end of the Junior year.

The senior essay takes the form of a substantial article, no longer than 13,000 words, excluding footnotes and bibliography. Students present to their senior essay adviser a detailed prospectus of the essay, with bibliography, prior to midterm in the semester before the essay is due and a draft of at least ten pages, or a detailed outline of the entire essay, by the last day of reading period in the semester before they enroll in RSEE 490 or 491. A member of the faculty other than the adviser grades the essay.

Students pursuing a double major need to fulfill the senior requirement of both majors. If the second major allows, students may enroll in both RSEE 490 and 491 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 RSEE.

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

Students should be aware of opportunities for study and travel in Russia, 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 the region participating in established academic programs usually receive Yale College credit, and are strongly encouraged to take advantage of study abroad opportunities during summers or through the Year or Term Abroad program. Students wishing to travel abroad as part of the major should consult the DUS.

REQUIREMENTS OF THE MAJOR

Prerequisites *Russian Studies concentration* – RUSS 140, 142, 145 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 150 and 151 or equivalency exam

Distribution of courses *All concentrations* – 2 courses in Russian, East European, or Eurasian 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 490 or 491)

FACULTY ASSOCIATED WITH THE MAJOR

Professors Sergei Antonov (*History*), Edyta Bojanowska (*Slavic Languages & Literatures*), Paul Bushkovitch (*History*), Katerina Clark (*Comparative Literature, Slavic Languages & Literatures*), John Gaddis (*History*), John MacKay (*Slavic Languages & Literatures, Film & Media Studies*), Timothy Snyder (*History*)

Associate Professors Molly Brunson (*Slavic Languages & Literatures*), Jason Lyall (*Political Science*), Douglas Rogers (*Anthropology*), Marci Shore (*History*)

Assistant Professors Marijeta Bozovic (*Slavic Languages & Literatures, Film and Media Studies, Women's, Gender, & Sexuality Studies*), Jinyi Chu (*Slavic Languages & Literatures*), Marta Figlerowicz (*Comparative Literature, English*), Claire Roosien (*Slavic Languages & Literatures*)

Senior Lectors II Irina Dolgova, Constantine Muravnik

Senior Lectors Krystyna Illakowicz, Julia Titus, Karen von Kunes

Science

Yale College offers a yearlong interdepartmental course sequence for first-year students with strong preparation in the sciences who do not intend to major in science. SCIE 030 and 031, Current Topics in Science, presents a broader range of topics than standard courses and highlights the interdependence of the scientific disciplines. For first-year students interested in research, SCIE 010 and 011, Perspectives on Biological Research, combines lectures from Yale faculty on their own research, as well as instruction on those skills essential for any successful scientist. SCIE 099, Introduction to Research Methods in Physics and Biology: Preparing for a First Research Experience, spans both the classroom and laboratory, providing an immersive introduction to scientific research. Application information is available on the First-Year Seminar website.

Sociology

Director of undergraduate studies: Jonathan Wyrzten (jonathan.wyrzten@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 four undergraduate programs leading to the B.A. degree: (1) the non-intensive and intensive majors focus on sociological concepts, theories, and methods; (2) the concentration in economy and society focuses on the cultural frameworks, social ties, 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 student-designed program combines sociology with a concentration in another field. 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 110–149, courses in sociological theory from 150–159, courses in sociological methods from 160–169, intermediate courses from 150–299, advanced courses in the 300s, and individual study and research courses in the 400s. First-year seminars are numbered below 100 and count as introductory or intermediate courses.

PREREQUISITE

Students interested in the Sociology major should complete either a first-year seminar or at least one introductory course (numbered SOCY 110–149), ideally by the end of the sophomore year. This course may be applied toward the requirements of the major. The DUS can waive the introductory course requirement for students who demonstrate adequate preparation for advanced coursework in sociology.

REQUIREMENTS OF THE MAJOR

Non-intensive and intensive majors The requirements for the non-intensive and intensive major are given here. (The three areas of concentration have slightly different requirements, as specified below.)

1. Thirteen term courses in sociology (including the prerequisite and senior colloquium), of which normally no more than two may be drawn from outside the Sociology department. At least one must be an introductory Sociology course or a substitute approved by the DUS, but no more than two introductory courses may count toward the total.
2. Two courses in sociological theory and two in sociological methods, normally completed by the end of the junior year. SOCY 151 and 152 are the required courses for theory. SOCY 160 and one additional Sociology course numbered SOCY 161–169 are required for methods. Other methods courses from outside the department can be approved at the discretion of the DUS. Students planning to study abroad in their junior year are strongly encouraged to begin meeting the theory and methods requirements in their sophomore year. They should also discuss the options for their course of study with the DUS before finalizing their plans.
3. One advanced seminar in Sociology (SOCY 300–399).
4. The senior requirement.

Concentration: Economy and Society Students in the economy and society concentration gain a broad understanding of markets and their relationship to social networks, religion, the state, and culture. Students explore the field of economic sociology, develop insights into market logics and economic outcomes, and develop skills in network analysis. Requirements for the concentration are:

1. Thirteen term courses in sociology (including the prerequisite and senior colloquium). At least one must be an introductory Sociology course or a substitute approved by the DUS, but no more than two introductory courses in any department or program may count toward the total. Up to four courses may be drawn from outside the Sociology department, with approval from the DUS.
2. SOCY 160 and one theory course (SOCY 151 or 152).
3. Two intermediate or advanced courses in economic sociology (e.g., SOCY 234, 314, 321).
4. At least one intermediate or advanced course in microeconomics (e.g., ECON 121 or 125).
5. The senior requirement, integrating sociology with business, markets, or economic behavior.

Concentration: Health and Society Students in the health and society concentration gain a broad understanding of how supraindividual 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 are:

1. Thirteen term courses in Sociology (including the prerequisite and senior colloquium).
2. SOCY 126 or SOCY 127, the gateway courses for the concentration (or other similar course, with approval of DUS).
3. One theory course (SOCY 151 or SOCY 152).
4. A course in statistics (SOCY 162, S&DS 103, S&DS 105, or GLBL 121, or a higher-level statistics course approved by the DUS).
5. SOCY 160 or a comparable course approved by the DUS.
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 101, BIOL 102, BIOL 103, BIOL 104; MATH 112 or higher-level MATH course; ECON 170.
7. Two upper-level Sociology seminars (200 or 300 level), or other courses approved by the DUS.
8. The senior requirement, integrating sociology with health and medicine.

Concentration: Student-Designed This program allows students to combine the study of sociology with the study of another discipline or substantive area, and to design a program that satisfies their own interests and career plans. By the beginning of the junior year, participants in the combined program are expected to consult with the DUS in order to obtain approval for their course of study. The requirements for this concentration are:

1. Thirteen term courses (including the prerequisite and senior colloquium), of which at least nine and no more than ten are selected from Sociology, the remainder (up to four) being chosen from another department or program. At least one must be an introductory Sociology course or a substitute approved by the DUS, but no more than two introductory courses in any department or program may count toward the total. The courses outside Sociology must constitute a coherent unit alone and form a logical whole when combined with the Sociology courses.
2. Two courses in sociological theory and two in sociological methods, normally completed by the end of the junior year. SOCY 151 and 152 are the required theory courses. SOCY 160 and one additional Sociology course numbered SOCY 161–169 are the required method courses. Other methods courses from outside the department can be approved at the discretion of the DUS. Students planning to study abroad in their junior year are strongly encouraged to begin meeting the theory and methods requirements in their sophomore year. They should also discuss the options for their course of study with the DUS before finalizing their plans.
3. One advanced seminar in Sociology (SOCY 300–399).
4. The senior requirement, integrating sociology and the other subject chosen.

Credit/D/Fail courses A maximum of two courses taken Credit/D/Fail may be counted toward the requirements of the major.

SENIOR REQUIREMENTS

For the non-intensive major Students electing the non-intensive major take one additional seminar in Sociology (SOCY 300–399) and write a one-credit senior essay during the senior year (SOCY 491 or SOCY 492). 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 491 or SOCY 492 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 493, 494 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 493, 494. 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 the last day of classes in the spring term of their junior year. The intensive major is especially recommended for students considering graduate school or social research. In special circumstances, applications may be accepted through the first week in the first term of the senior year. An email indicating interest to the DUS should include a one-paragraph description of the topic, a list of relevant courses taken, and choice of a prospective senior essay adviser. 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.

REQUIREMENTS OF THE MAJOR

Prerequisite 1 first-year sem or intro course (SOCY 110–149) or equivalent

Number of courses 13 term courses (incl prereq and senior essay)

Specific courses required *Non-intensive major and Student-Designed concentration*

– SOCY 151, 152, 160, 1 addtl course from SOCY 161–169; *Economy &*

Society concentration – SOCY 151 or 152; SOCY 160; *Health & Society concentration*

– SOCY 126 or 127, SOCY 151 or 152, SOCY 160, or a comparable course approved by the DUS.

Distribution of courses *Non-intensive major, Economy & Society concentration, and*

Student-Designed concentration – at least 1, but no more than 2 intro courses; *Non-*

intensive major – 1 sem from SOCY 300–399; *Economy & Society concentration* – 2

intermed or adv courses in economic sociology (e.g., SOCY 234, 314, 321) and 1 in

microecon (ECON 121 or 125); *Health & Society concentration* – 1 course in stat, as

specified; 2 upper-level sems, as specified; *Student-Designed concentration* – 9 or 10

courses in sociology; 3 or 4 courses from another dept, as specified; 1 sem from

SOCY 300–399

Substitution permitted *Non-intensive major* – up to 2 courses from other depts;

Economy & Society concentration – up to 4 courses from other depts, with DUS

approval; *Health & Society concentration* – up to 5 courses from other depts, with

DUS approval

Senior requirement *Non-intensive major* – 1 addtl 300-level Sociology sem and senior

essay (SOCY 491 or SOCY 492); *Intensive major* – two-term senior essay (SOCY 493,

494)

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, †Marissa King, †Issa Kohler-Hausmann, Jonathan Wrytzen

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: Sarah Khan (sarah.khan@yale.edu), 213 RKZ, 115 Prospect St.; southasia.macmillan.yale.edu

The program in South Asian Studies combines the requirements of a discipline-based first major with significant course work 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

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 200 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 course work 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). Students who matriculate with advanced proficiency in a South Asian language (excluding English), as demonstrated through testing, are encouraged to study Sanskrit, or to study a second modern language through Yale courses or the Directed Independent Language Study program. Students may request 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.

Credit/D/Fail A maximum of one course taken Credit/D/Fail may count toward the major.

SENIOR REQUIREMENT

The senior requirement may be fulfilled by completion of a seminar that culminates in a senior essay. Alternatively, the requirement may be fulfilled by completion of a one-credit, two-term senior research project in SAST 491, 492, or by completion of a one-credit, one-term directed study in SAST 486 that culminates in a senior essay. The senior essay should be a substantial paper with a maximum length of 8,000 words for one term, and 10,500 words for two terms. The use of primary materials in the languages of the region is encouraged in senior essay projects. The DUS must approve senior essay 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.

REQUIREMENTS OF THE MAJOR

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 200 or above, 2 in premodern, 2 sems

Substitution permitted One relevant course in another dept, and/or up to 3 study abroad credits with DUS permission

Language requirement Study in a South Asian lang through L5 level

Senior requirement Senior essay in sem, or research project in SAST 491, 492, or senior essay in SAST 486

FACULTY ASSOCIATED WITH THE PROGRAM OF SOUTH ASIAN STUDIES

Professors Akhil Amar (*Law School*), Sunil Amrith (*History*), Tim Barringer (*History of Art*), Veneeta Dayal (*Linguistics*), Nihal de Lanerolle (*School of Medicine*), Michael Dove (*Anthropology, Forestry & Environmental Studies*), Phyllis Granoff (*Religious Studies*), Robert Jensen (*Economics*), Mushfiq Mobarak (*Economics, School of Management*), Kaiyan Munshi (*Economics*), Rohini Pande (*Economics*), Kalyanakrishnan Sivaramakrishnan (*Anthropology, Forestry & Environmental Studies*), Shyam Sunder (*School of Management*), Steven Wilkinson (*Political Science*)

Associate Professors Rohit De (*History*), Mayur Desai (*Public Health*), Zareena Grewal (*Ethnicity, Race, & Migration*), Kishwar Rizvi (*History of Art*)

Assistant Professors Supriya Gandhi (*Religious Studies*), Subhashini Kaligotla (*History of Art*), Sarah Khan (*Political Science*), Priyasha Mukhopadhyay (*English*)

Senior Lecturer Carol Carpenter (*Anthropology, Forestry & Environmental Studies*)

Lecturer Hugh Flick, Jr. (*Religious Studies*)

Senior Lectors Seema Khurana, Swapna Sharma

Lector Aleksandar Uskokov

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The Department of South Asian Studies offers a Certificate of Advanced Language Study in Hindi. 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, which ordinarily is an advanced seminar with an additional weekly discussion section in the target language, to count toward the 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.

Southeast Asia Studies

Chair: Erik Harms (erik.harms@yale.edu), 10 Sachem Street, 436-4276; program manager: Kristine Mooseker (kristine.mooseker@yale.edu), 311 LUCE, 432-3431; language program director: Dinny Aletheiani (dinny.aletheiani@yale.edu); cseas.yale.edu/

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, including Anthropology, Environmental Studies, History, History of Art, Music, Philosophy, and Political Science. 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.

FACULTY ASSOCIATED WITH THE COUNCIL ON SOUTHEAST ASIA STUDIES

Professors Michael R. Dove (*Forestry & Environmental Studies*), J. Joseph Errington (*Anthropology*), Benedict Kiernan (*History*), James Scott (*Political Science*), Mimi Yiengpruksawan (*History of Art*)

Associate Professor Erik Harms (*Anthropology*)

Assistant Professor Alka Menon (*Sociology*)

Senior Lecturers Carol Carpenter (*Forestry & Environmental Studies, Anthropology*), Amity Doolittle (*Forestry & Environmental Studies*)

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*)

CERTIFICATE OF ADVANCED LANGUAGE STUDY

The Department of Southeast Asian Studies offers a Certificate of Advanced Language Study in Vietnamese. A certificate adviser, typically the director of undergraduate studies (DUS) or language program director (dinny.aletheiani@yale.edu), 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, which ordinarily is an advanced seminar with an additional weekly discussion section in the target language, to count toward the 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.

Spanish

Director of undergraduate studies: Rolena Adorno

(rolena.aldorno@yale.edu) [F]; Noël Valis (noel.valis@yale.edu) [Sp]; language program director: Ame Cividanes (ame.cividanes@yale.edu), Rm. 503, 320 York St., 432-1159; 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 110–199 include beginning and intermediate language courses designed to help students develop fluency in understanding, speaking, reading, and writing Spanish. Courses numbered SPAN 200–299 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 300–499 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 140, 142, or 145, or the equivalent through advanced placement or study abroad. Equivalent preparation to SPAN 140, 142, or 145 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 110. Students who take SPAN 110 are strongly encouraged to continue with 120 in the following term. Students wishing to take intensive beginning Spanish may, with the instructor's permission, enroll in SPAN 125, which covers the same material as SPAN 110 and 120, but in one term. SPAN 132 and 142 are designed for heritage speakers and are available only to them. Admission to SPAN 132 and 142 is based on 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 in order 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 about preregistration procedures for Spanish L1–L4 language courses is available on the department website.

REQUIREMENTS OF THE MAJOR

The major for the Class of 2022 and subsequent classes A maximum of one course taught in English may be counted toward the major requirements. With DUS approval, students who declared their major under previous requirements may also avail themselves of this change.

Beyond the prerequisite, ten term courses numbered SPAN 200 or higher are required, five of which must be numbered SPAN 300 or higher. SPAN 491, The Senior Essay, counts as one of the ten required courses. A maximum of one course may be numbered SPAN 200–230. First-year seminars taught in Spanish count toward the major in the SPAN 231–299 range.

Intensive major Students in the intensive major fulfill the requirements for the standard major, and take an additional two courses numbered SPAN 300 or higher.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

Seniors write the senior essay in SPAN 491 in the spring of their senior year under the individual direction of a faculty adviser. Students expecting to complete their degree requirements in December write the senior essay in SPAN 491 in the fall of their senior year. Seniors in SPAN 491 are expected to submit their completed essay to the DUS by 4 p.m. on December 7 in the fall term, or by 4 p.m. on April 15 in the spring term. If the essay is submitted late without an excuse from the student's residential college dean, the penalty is one letter grade, though no essay that would otherwise pass will be failed because it is late.

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 literature courses in Spanish. A list of pertinent graduate courses is available at the office of the DUS.

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 Arrangements. Students who wish to count courses taken abroad toward the major should consult with the DUS before going abroad.

REQUIREMENTS OF THE MAJOR

Prerequisite 1 course from SPAN 140, 142, 145, or equivalent

Number of courses 10 term courses (including senior requirement)

Distribution of courses 10 term courses numbered SPAN 200 or higher, 5 of which are numbered SPAN 300 or higher; max of one course numbered SPAN 200–230; max of one SPAN course taught in English with DUS approval

Senior requirement Senior essay (SPAN 491)

Intensive major 2 addtl courses numbered SPAN 300 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 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, 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 300-level course advanced undergraduate lecture or seminar. All Yale Spanish courses at the 200- or 300-level, which carry an L5 designation, count toward the requirement. First-Year Seminars taught in Spanish count as courses in the SPAN 231–299 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 certificate adviser, one advanced non-L5 course conducted in the target language, such as an independent study course, a graduate seminar, or an advanced seminar may count toward certification requirements.

The certificate adviser may approve the substitution of one credit earned as part of a Yale or Yale-designated study abroad program 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.

FACULTY OF THE DEPARTMENT OF SPANISH AND PORTUGUESE

Professors Rolena Adorno, Roberto González Echevarría, Aníbal González-Pérez, K. David Jackson, Noël Valis, Jesús R. Velasco (*Chair*)

Senior Lectors II Sybil Alexandrov, Margherita Tortora, Sonia Valle

Senior Lectors I 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, Virginia Santos, Terry Seymour, María M. Vázquez

Lectors Carolina Baffi, Luna Nájera, Igor de Souza, Giseli Tordin

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 Renaissance studies should visit the Renaissance 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 (DUSes) 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.

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 491, 492, 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. DUSes 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 DUSes 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 DUSes and other faculty members to judge whether or not this is the case.

REQUIREMENTS OF THE MAJOR

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 491 and/or 492), or, with DUS permission, written or oral exam, grad course, or tutorial

Statistics and Data Science

Director of undergraduate studies: Sekhar Tatikonda (sekhar.tatikonda@yale.edu), Rm. 338, 17 Hillhouse Ave., 432-4714; 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 100 and S&DS 101–109 and S&DS 123 (YData) assume knowledge of high-school mathematics only. Students who complete one of these courses should consider taking S&DS 230. This sequence provides a solid foundation for the major. Other courses for nonmajors include S&DS 110 and 160.

PREREQUISITES

Multivariable calculus is required and should be taken before or during the sophomore year. This requirement may be satisfied by one of MATH 120, ENAS 151, MATH 230, MATH 302, or the equivalent.

REQUIREMENTS OF THE MAJOR

Students who wish to major in Statistics and Data Science are encouraged to take S&DS 220 or a 100-level course followed by S&DS 230. Students should complete the calculus prerequisite and linear algebra requirement (MATH 222 or 225 or 226) 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 222 or 225 or MATH 226 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. (B.S. degree candidates must take S&DS 242 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 242), Computational Skills, Methods of Data Science, 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 242.

Examples of such courses include: S&DS 238, 241, 242, 312, 351

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 220 or 230, 262, 425, CPSC 100 or 112, or ENAS 130 (substitution of CPSC 201 or 223 is permitted)

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.

Examples of such courses include: S&DS 312, 361, 363, 365, 430, 468, EENG 400, CPSC 477

Mathematical Foundations and Theory All students in the major must know linear algebra as taught in MATH 222 or 225 or MATH 226. Students who have learned linear algebra through other courses (such as MATH 230, 231) 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 364, 400, 410, 411, CPSC 365, 366, 469, MATH 222, 225, MATH 226 244, 250, MATH 255, MATH 256, 260, 300, 301, or MATH 302

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 223, 323, 424, 437

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 376, EVST 362, GLBL 191, 195, LING 229, 234, 380, PLSC 454, PSYC 258

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 453, 470, 475, ECON 136, 420, EENG 445, S&DS 352, LING 227

Substitution Some substitution, particularly of advanced courses, may be permitted with DUS approval.

Credit/D/Fail Credit/D/Fail may not be counted toward the requirements of the major (this includes prerequisite courses).

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

Students in both the B.A. degree program and B.S. degree program complete the senior requirement by taking a capstone course (S&DS 425) or an individual research project course. Courses for research opportunities include S&DS 490, S&DS 491, or S&DS 492, 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. Students must complete a research project to be eligible for Distinction in the Major.

ADVISING

Students intending to major in Statistics and Data Science should consult the department's 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 K, Special 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 Statistics and Data Science.

REQUIREMENTS OF THE MAJOR

Prerequisites *Both degrees*—MATH 120, ENAS 151, MATH 230, MATH 302, 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 222 or 225 or MATH 226; *B.S.*—same, plus 1 Core Probability and Statistics course must be S&DS 242

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 Seminar (S&DS 490) or Senior Project (S&DS 491 or S&DS 492) or Statistical Case Studies (S&DS 425)

CERTIFICATE IN DATA SCIENCE

The Certificate in Data Science is designed for students majoring in disciplines other than Statistics & 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.

PREREQUISITE

The suggested prerequisite for the certificate is an introductory course, selected from one of the following courses: S&DS 100, 101–109, 123 or 220, or an introductory data analysis course from another department.

REQUIREMENTS OF THE CERTIFICATE

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 (or Pass for courses taken in Spring 2020).

Probability and Statistical Theory One from S&DS 238, 240, 241, 242. Advanced students may substitute S&DS 351 or S&DS 364 or EENG 431.

Statistical Methodology and Data Analysis Two from S&DS 230, 242, 312, 361, 363, PLSC 349. ECON 136 may be substituted for S&DS 242.

Computation & Machine Learning One from S&DS 262, 317, S&DS 355, 365, CPSC 223, 477, PLSC 468. CPSC 323 may be substituted for CPSC 223.

Data Analysis in a Discipline Area Two half-credit courses or one full-credit 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.

REQUIREMENTS

Prerequisite 1 term course from S&DS 100, 101–109, 123 or 220 (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 2 half-credit courses or 1 course in discipline area, as specified

FACULTY OF THE DEPARTMENT OF STATISTICS AND DATA SCIENCE

Professors †Donald Andrews, Andrew Barron, †Jeffrey Brock, Joseph Chang, †Katarzyna Chawarska, †Xiaohong Chen, †Nicholas Christakis, †Ronald Coifman, †James Duncan, John Emerson (*Adjunct*), †Debra Fischer, †Alan Gerber, †Mark Gerstein, Anna Gilbert, John Hartigan (*Emeritus*), †Edward Kaplan, †Harlan Krumholz, John Lafferty, David Pollard (*Emeritus*), †Nils Rudi, Jasjeet Sekhon, †Donna Spiegelman, Daniel Spielman, †Hemant Tagare, †Van Vu, †Heping Zhang, †Hongyu Zhao, Harrison Zhou, †Steven Zucker

Associate Professors †Peter Aronow, †Forrest Crawford, Ethan Meyers (*Visiting*), Sahand Negahban, Sekhar Tatikonda, Yihong Wu

Assistant Professors Elisa Celis, Zhou Fan, †Joshua Kalla, †Amin Karbasi, Roy Lederman, †Vahideh Manshadi, †Fredrik Savje, †Ilker Yildirim

Senior Lecturer Jonathan Reuning-Scherer

Lecturers William Brinda, Elena Khusainova

†A joint appointment with primary affiliation in another department or school.

Theater and Performance Studies

Director of undergraduate studies: Shilarna Stokes (shilarna.stokes@yale.edu), Rm. 102C, 220 York St., 432-1310; theaterstudies.yale.edu; dance studies; musical theater

The mission of the program in Theater and Performance Studies (TAPS) 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, compositional 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, literature, and languages. 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 Yale School of Drama regularly teach for TAPS, and TAPS students have ample opportunities to interact with graduate students in the various departments of YSD. Courses across the TAPS curriculum provide opportunities for students to attend performances by professional companies and artists, as well as to learn from discussions, workshops, and lectures offered by prominent guest artists and scholars.

Special features of the program are its production seminars, independent studies, and production-based senior projects. Production seminars, taken with permission of the instructor, offer immersive, semester-long performance research and development, culminating in public campus 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 majors. Production-based senior projects are described in the section on Senior Requirements below.

In addition to the theater and performance studies curricula, three additional programs are integrated into the vision for 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 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 the American Musical Theater as an indigenous 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 (TAPS) 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.

TAPS also supports three substantial co-curricular initiatives: the Performance Studies working group, the Yale Playwrights Festival, and the Yale Dance Lab.

Students in the Class of 2022 and 2023 With approval from the director of undergraduate studies (DUS), the following changes to the prerequisites and requirements of the major may be fulfilled by students who declared their major under previous requirements.

Students in the Class of 2024 and subsequent classes follow the prerequisites and major requirements as indicated.

PREREQUISITES

The prerequisites for the major are THST 110 and THST 111.

Acting and Directing Students wishing to take regularly offered upper-level courses in acting (THST 211, THST 311) and directing (THST 300, 301) must first take THST 210, which does not require an audition.

Dance Studies There are no prerequisites for courses in dance studies, though many require an audition or application process, and the permission of the instructor.

Shen Curriculum for Musical Theater There are no prerequisites for Shen curriculum courses, though all courses require an audition or application process, as well as permission of the instructor.

REQUIREMENTS OF THE MAJOR

The major for the Class of 2022 and Class of 2023 With the approval of the DUS, the following changes to the requirements of the major may be fulfilled by students who declared their major under previous requirements.

The major for the Class of 2024 and subsequent classes The major consists of ten term courses beyond the introductory prerequisites (THST 110, 111). Of the ten required term courses, students must take two courses in each of four domains of knowledge: Artistic Practice; Interarts; Histories; and Performance Theory. Most courses are listed

in more than one domain, though they may only count for one domain requirement for a given student.

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 This domain invites students to experience art-making in 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; the integration of methods and systems of knowledge drawn from diverse fields.

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; reenacting historical performance and adaptation in new forms.

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; investigating dynamic relationship between archives and repertoires.

Credit/D/Fail Courses taken Credit/D/Fail may not be counted toward the requirements of the major in Theater and Performance Studies.

SENIOR REQUIREMENTS

Majors satisfy the senior project requirement in one of two ways. They may, with the approval of the DUS, take a THST seminar as a senior seminar. In such cases, the expectations for the final essay (minimum of thirty pages) are substantially higher for students using the course to fulfill their senior requirement. Or, under the supervision of a faculty adviser, a student may undertake a one-term senior project in either the fall

or spring semester (THST 491). Depending upon an individual student's preparation, course work, and research objectives, a senior project may take many forms. A senior may direct, design, or devise a theatrical production, write a play, musical, or thesis-length essay, create a documentary film or digital media production, perform a role, choreograph a dance piece, or design an original performance-based research project. Seniors engaging in production-based senior projects must also complete a shorter senior essay (minimum of fifteen pages), as a requirement of THST 491.

To ensure that their course work aligns with their goals, students should begin discussing senior project ideas and plans with the DUS at the start of their junior year. Senior Project meetings for all juniors are held early in the spring semester, with research and production proposals due the Friday before spring break.

ADVISING

Courses in Theater and Performance Studies are open to all undergraduate students. Most are limited enrollment courses and therefore require a short application, writing sample, or audition. 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 and Performance Studies or first-year students and sophomores who have informed the DUS of their intent to declare the major. TAPS 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 TAPS major are encouraged to meet with the DUS once a semester in order to discuss goals, learn about opportunities, and ask questions.

COURSES IN THE SCHOOL OF DRAMA

Majors in Theater and Performance Studies are eligible to take School of Drama courses in design, theory, dramaturgy, and theater management, with permission of the instructor, the DUS, the registrar of the School of Drama, and "blue form" approval submitted by their academic dean to the Registrar's Office. Undergraduates may not, however, enroll in acting or directing courses offered by the School of Drama. Students enrolling in School of Drama courses should note that a maximum of four term courses from the professional schools may be offered toward the bachelor's degree. Students also should note that the academic calendars of the School of Drama and of Yale College differ. The School of Drama calendar should be consulted for scheduling. A student interested in taking a course at the Yale School of Drama should begin by seeking the permission of the instructor and contacting their academic dean.

REQUIREMENTS OF THE MAJOR

Prerequisites THST 110, 111

Number of courses 10 term courses beyond prerequisites (including senior requirement)

Distribution of courses 2 courses in each of four domains: Artistic Practice, Interarts, Histories, Performance Theory

Senior requirement Senior seminar or senior project (THST 491)

FACULTY ASSOCIATED WITH THE PROGRAM OF THEATER AND PERFORMANCE STUDIES

Professors James Bundy (*School of Drama, Theater and Performance Studies*), David Chambers (*Adjunct*) (*Theater and Performance Studies*), *Toni Dorfman (*Adjunct*)

(*Theater and Performance Studies*), Joan MacIntosh (*Practice*) (*Theater and Performance Studies, School of Drama*), *Lawrence Manley (*English*), *Deb Margolin (*Practice*) (*Theater and Performance Studies*), Donald Margulies (*Adjunct*) (*English, Theater and Performance Studies*), *Charles Musser (*Film & Media Studies, American Studies, Theater and Performance Studies*), Tavia Nyong'o (*Theater and Performance Studies, American Studies*), *Marc Robinson (*School of Drama, Theater and Performance Studies, English*), Gregory Wallace (*Practice*) (*School of Drama, Theater and Performance Studies*)

Associate Professor Emily Coates (*Adjunct*) (*Theater and Performance Studies, School of Drama*)

Assistant Professor Elise Morrison (*Theater and Performance Studies*)

Lecturers Hal Brooks, Lacina Coulibaly, Alan Edwards, Daniel Egan, Grant Herreid, Irène Hultman, Annette Jolles, Michael Korie, Bronwen MacArthur, Marsha Norman, Nathan Roberts, Renee Robinson, Michael Rossmly, Brian Seibert, Shilarna Stokes, Daniel Ulbricht

*Member of the Executive Committee for the program.

Urban Studies

Director of undergraduate studies: Elihu Rubin, (elihu.rubin@yale.edu) RDH, 180 York St., 436-4641; 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. The major introduces students to the following bodies of knowledge: history, theory, and contemporary analysis of urban morphologies, spaces, societies, and political economies; conceptual tools and analytical methods to understand urban environments and issues through spatial terms; and practices of and speculative approaches to 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. For additional information visit the Urban Studies website.

REQUIREMENTS OF THE MAJOR

Thirteen term courses are required for the major, including the senior requirement. Each student, in consultation with the 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 senior requirement); 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.

Surveys: URBN 160, 280, 341, 345, AMST 163, 196, ANTH 414, ARCH 385, EVST 226, HSHM 211

Methods Courses Students choose URBN 353, 360, or 362 as one of the three required courses from the following list that introduces 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.

Methods Courses: URBN 200, 230, 353, 360, 362, AMST 348, ANTH 303, EVST 290, SOCY 160, 169

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.

Credit/D/Fail No course taken Credit/D/Fail may be counted toward the Urban Studies major.

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 490, Senior Research Colloquium in the fall and URBN 491, Senior Project in the spring. The senior project may be a written paper or a project that could encompass a variety of media. The primary adviser must be a member of the architecture faculty. Students not choosing a yearlong project may enroll in an advanced seminar (ARCH 400–490), and produce a final paper of twenty to twenty-five pages in addition to existing course work. The seminar should be selected in consultation with the DUS. Note that students pursuing this 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. The intent to major process includes submission of an Intent to Major form with requested materials (see form) followed by a meeting with the DUS to discuss the intended course of study. More information regarding this process, the relevant forms, and the submission link are available on the program website. Schedules for majors must be discussed with, and approved by, the DUS in Urban Studies. Only then may a schedule be submitted to the residential college dean's office.

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 course work and previous performance.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 13 courses (incl senior req)

Specific courses required URBN 353, 360 or 362

Distribution of courses 3 surveys, inc 1 URBN course (to be completed by second year); 3 methods courses, one of which is URBN 353, 360 or 362; 4–6 electives as specified

Senior requirement URBN 490 and 491; or adv seminar (URBN 400–490) 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

Directors of undergraduate studies: Rene Almeling (rene.almeling@yale.edu) and Craig Canfield (craig.canfield@yale.edu) (co-DUSes); 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 concentration, and write a yearlong or single-term senior essay. The program encourages work that is interdisciplinary, intersectional, international, and transnational. Individual concentrations evolve along with students' intellectual growth and academic expertise. Recent examples of concentrations 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

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 205, 206, 207, or 340. Majors are strongly encouraged to take these intermediate courses during their first two years. The major also requires two methodology courses, five courses in an area of concentration, the junior research seminar (WGSS 398), and a two-course senior requirement. The area of concentration consists of at least five 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 director of undergraduate studies (DUS).

Methodology courses Given its interdisciplinary nature, Women's, Gender, and Sexuality Studies 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 two methodologies relevant to their own concentration and planned senior essay. Students are advised to take the first of these courses during their first two years and to complete the two-course methods requirement in the junior year, in preparation for the senior essay.

Junior research seminar All students in the major must take WGSS 398, Junior Research Seminar, which provides majors opportunity to examine, synthesize, and apply the interdisciplinary theory and methods to which they have been exposed while completing the intermediate course sequence and methodology requirement. (Individualized alternatives are found for students who study abroad during the junior year.)

SENIOR REQUIREMENT

The yearlong senior essay The two-term senior sequence consists of WGSS 490, Senior Colloquium, in which students begin researching and writing a senior essay, followed by WGSS 491, 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 concentration. 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 twenty-five to forty-five pages 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior requirement)

Specific courses required WGSS 398

Distribution of courses 2 intermediate courses; 2 methodology courses; 5 electives in area of concentration

Senior requirement Senior colloquium and senior essay (WGSS 490, 491); 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 Roderick Ferguson (*Chair*), Scott Herring (*American Studies*), Margaret Homans (*English*), Regina Kunzel (*History*), Gail Lewis (*Visiting Presidential Fellow*), Dara Strolovitch, Laura Wexler (*American Studies*)

Associate Professor Joseph Fischel

Assistant Professors Eda Pepi, Evren Savci

Senior Lecturer Maria Trumpler

Lecturers Melanie Boyd, Graeme Reid, Craig Canfield

Affiliated Faculty Julia Adams (*Sociology*), Rene Almeling (*Sociology*), Carol Armstrong (*History of Art*), Daniel Botsman (*History*), Claire Bowerman (*Linguistics*), Marijeta Bozovic (*Slavic Languages & Literatures*), Rosie Bsheer (*History*), Jill Campbell (*English*), Hazel Carby (*Emeritus*) (*African American Studies, American Studies*), Kang-i Sun Chang (*East Asian Languages & Literatures*), Becky Conekin (*History*), Deborah Davis (*Sociology, East Asian Studies*), Rohit De (*History*), Igor De Souza (*English, Humanities*), Carolyn Dean (*History, French*), Kathryn Dudley (*American Studies, Anthropology*), Ziv Eisenberg (*History*), Ron Eyerman (*Sociology*), Crystal Feimster (*African American Studies*), Marta Figlerowicz (*Comparative Literature, English*), Moira Fradinger (*Comparative Literature*), Glenda Gilmore (*Emeritus*) (*History*), Jacqueline Goldsby (*African American Studies, American Studies, English*), Gregg Gonsalves (*Law School, Public Health*), Inderpal Grewal (*Emeritus*) (*American Studies*), Zareena Grewal (*American Studies, Religious Studies*), Dolores Hayden

(*Emeritus*) (*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 (*Emeritus*) (*Psychology*), H el ene Landemore-Jelaca (*Political Science*), Kathryn Lofton (*American Studies, History, Religious Studies*), Lisa Lowe (*American Studies, Ethnicity, Race and Migration*), Mary Lui (*American Studies, History*), Karuna Mantena (*Political Science*), Deb Margolin (*Adjunct*) (*Theater Studies*), 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*), Tavia Nyong'o (*Theater Studies, American Studies*), John Pachankis (*Public Health*), Sally Promey (*American Studies, Institute of Sacred Music*), Ana Ramos-Zayas (*American Studies, Ethnicity, Race & Migration*), Judith Resnik (*Law School*), Jill Richards (*English*), Naomi Rogers (*History, History of Science, Medicine & Public Health*), Frances Rosenbluth (*Political Science*), 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 & Literatures, Comparative Literature*), Claudia Vaggia (*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 Advanced Study (M.A.S.), 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/education/admissions>

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>

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>

COURSES

A

- 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)

B

- Biology (BIOL)
- Biomedical Engineering (BENG)
- Bosnian-Serbian-Croatian (SBCR)
- British Studies (BRST)
- Burmese (BURM)

C

- 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)

D

- Directed Studies (DRST)
- Dutch (DUTC)

E

- 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)

F

- Film and Media Studies (FILM)
- Finnish (FNSH)
- Forestry and Environment Studies (F&ES)
- French (FREN)

G

- German Studies (GMAN)
- Global Affairs (GLBL)
- Global Health Studies (HLTH)

H

- 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)

I

- Indonesian (INDN)
- Italian Studies (ITAL)

J

- Japanese (JAPN)
- Judaic Studies (JDST)

K

- Khmer (KHMR)
- Kiswahili (SWAH)
- Korean (KREN)

L

- Latin (LATN)
- Latin American Studies (LAST)
- Linguistics (LING)

M

- 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)

N

- Naval Science (NAVY)
- Near Eastern Languages and Civilizations (NELC)
- Neuroscience (NSCI)

O

- Ottoman (OTTM)

P

- Persian (PERS)
- Philosophy (PHIL)
- Physics (PHYS)
- Polish (PLSH)
- Political Science (PLSC)
- Portuguese (PORT)

- Psychology (PSYC)
- Punjabi (PNJB)

R

- Religious Studies (RLST)
- Romanian (ROMN)
- Russian (RUSS)
- Russian, East European, and Eurasian Studies (RSEE)

S

- 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)

T

- Tamil (TAML)
- The DeVane Lecture Course (DEVN)
- Theater and Performance Studies (THST)
- Tibetan (TBTN)
- Turkish (TKSH)
- Twi (TWI)

U

- Ukrainian (UKRN)
- Urban Studies (URBN)

V

- Vietnamese (VIET)

W

- Wolof (WLOF)
- Women's Gender and Sexuality Studies (WGSS)

Y

- Yoruba (YORU)

Z

- Zulu (ZULU)

Accounting (ACCT)

* ACCT 270a, Foundations of Accounting and Valuation Rick Antle

Modern accounting practices and their use in distinguishing value creation from value redistribution. Basic determinants of value and the techniques used to assess it; the creation of value through the production and delivery of goods or services; the conversion of that value into cash flows; basic financial statements, balance sheets, income statements, and cash flow statements, and the accounting mechanics with which they are built. Undergraduate enrollment limited to 50. Juniors and seniors only.

Aerospace Studies (USAF)

* USAF 101a, Heritage and Values of the U.S. Air Force I Rose Tseng

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 202a, The Evolution of U.S. Air and Space Power George Granholm

The development and employment of American air and space power from the Korean Conflict to the present. The distinctive capabilities and functions of air and space power; Air Force heritage and leaders; continued application of communication skills. Prerequisites: USAF 101, 102, and HIST 221. 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 301a, Leading People and Effective Communication I Mitchell Moen

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 401a, National Security, Leadership Responsibilities and Commissioning Preparation I Mitchell Moen

Overview of the complex social and political issues facing the military profession. Designed to provide seniors with a foundation for understanding their role as military officers in American society. Prerequisites: USAF 301, 302 and field training. 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.

African American Studies (AFAM)

* AFAM 013b / ENGL 005, Counterarchives: Black Historical Fictions Staff

While historical records have long been the source from which we draw our picture of the past, it is with literature and art that we attempt to speculatively work out that which falls between the cracks of conventional archival documentation, that

which cannot be contained by historical record – emotion, gesture, the sensory, the sonic, the inner life, the afterlife, the neglected and erased. This course examines how contemporary black writers have imagined and attempted to represent black life from the late 17th to the early 20th centuries, asking what fiction can tell us about history. Reading these works as alternative archives, or “counterarchives,” which index the excess and fugitive material of black histories in the Americas, we probe the uses, limits, and revelations of historical fictions, from the experimental and realist novel, to works of poetry and drama. Drawing on the work of various interdisciplinary scholars, we use these historical fictions to explore and enter into urgent and ongoing conversations around black life & death, African-American history & memory, black aesthetics, and the problem of “The Archive.” Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

*** AFAM 016b / AFST 015b / ENGL 015b, South African Writing after Apartheid**

Stephanie Newell

An introduction to creative writing published in South Africa from the end of Apartheid in 1994 to the present. Close readings of contemporary fiction with additional material drawn from popular culture, including films, magazines, and music. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** AFAM 017a / ENGL 006a, Black Nature: African American Nature Writing** Staff

What stories do we tell about nature? How are the stories we are *able* to tell about nature informed by race? And how do these stories shape our understanding of what it means to be human? In contrast to a largely white tradition of nature writing that assumes a superior position outside of Nature, this course undertakes a broad survey of African American nature writing. Over the course of the semester, we read broadly across several genres of African American literature, including: slave narrative, fiction, poetry, drama and memoir. In this way, we center the unique environmental perspectives of those, who, once considered no more than livestock, *were* the nature over which their white masters ruled. Indeed, as those who were drowned in the ocean during the trans-Atlantic slave trade, forced to cultivate the soil on slave plantations, and hung from trees across the Jim Crow South, black Americans are bound up and entangled in nature in incredibly complex and precarious ways. Perhaps for this very reason, however, we may ultimately come to find in these black nature stories the resources for reclaiming a proper relationship to the Earth, and for imagining a sustainable human life in nature, rather than apart from it. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

AFAM 114a / CLCV 114a / HUMS 114a / LITR 155a, Rhetoric, A User's Guide (from Ancient Greece to the American Present) Emily Greenwood Milne

This course explores the classical rhetorical tradition and the various ways in which it has been adapted in modern American rhetoric up to the present. We analyze rhetorical theory and practice in ancient Greece and Rome, using classical rhetoric as a lens through which to explore the craft of speech in American history, and vice versa. Students emerge from this course able to tell *aposiopesis* from *praeteritio*, but rather than dry lectures on the history of rhetoric, the approach in lectures and section discussions is comparative through and through, staging curious conversations between ancient and modern as we examine the paths of words through history. We consider what makes individual speeches noteworthy in their local, historical contexts, as well as

within a wider rhetorical tradition, and we analyze the role of ideologies of gender, race, class, education, nationality, religion, and sexuality in the construction of the rhetorical subject. In addition, the classical rhetorical tradition of Greece and Rome is compared and contrasted with parallel traditions of classical rhetoric in ancient China and India. Due attention is paid to methodological problems in the history of rhetoric and debates in rhetorical theory. WR, HU

AFAM 115b / WGSS 125b, “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

AFAM 118a / ER&M 249a / PSYC 336a / SOCY 153a, Is That Racist?: Theory and Methods for Diagnosing and Demonstrating Racism Phillip Atiba Goff

How do we know when something is racist? And how do we prove it to those who are skeptical? This course is designed to allow students to go beyond armchair pontificating about racism by exploring a broad range of ways social theorists have defined the term and methods they have used to demonstrate it. Together, we have the opportunity to read, critique, and synthesize scholarship from across disciplines, with the goal of refining our own definition of the term. To accomplish this, we examine the stakes of calling something racist, who benefits and who suffers from a given definition, and how racism functions across contexts (mostly) within the United States. We also learn about popular methods for demonstrating that an idea, feeling, behavior, person, or institution is racist and evaluate how evidence about racism (or lack thereof) can obscure a diagnosis of racism—or lead to an erroneous one. Throughout the course, we take opportunities to translate the theoretical and methodological lessons we learn to the world we live in today, from popular culture to dinner table conversations. While there are no statistical prerequisites, students will be asked to think about the logic of statistical analysis and should be comfortable reasoning about numbers. HU, SO

AFAM 146b / ECON 171b / EDST 271b, 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 162b / AMST 162b / HIST 187b, African American History from Emancipation to the Present Elizabeth Hinton

An examination of the African American experience since 1861. Meanings of freedom and citizenship are distilled through appraisal of race and class formations, the processes and effects of cultural consumption, and the grand narrative of the civil rights movement. WR, HU

AFAM 164b / PLSC 263b / URBN 304b, The Politics of "The Wire": HBO's Portrayal of the American City Allison Harris

This class uses HBO's groundbreaking series "The Wire" to investigate cities, their problems, and their politics. We watch all five seasons of the show as social scientists and use it to learn about important social scientific concepts and theories, and apply those theories to such phenomena as the politics of crime, policing, and local elections. Each week, the assigned readings—articles and book excerpts from political science as well as other social sciences—highlight the social scientific concepts displayed in the assigned episodes and provide context for lectures. All of the assignments work together to expose students to social science, how social science is conducted, and how political science can help us better understand the world around us. SO

*** AFAM 182b / AMST 286b / ENGL 182b / HUMS 241b, James Baldwin's American Scene** Jacqueline Goldsby

In-depth examination of James Baldwin's canon, tracking his work as an American artist, citizen, and witness to United States society, politics, and culture during the Cold War, the Civil Rights era, and the Black Arts Movement. HU

AFAM 186a / LAST 214a / PLSC 378a / SOCY 170a, Contesting Injustice Elisabeth Wood

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 freshmen and sophomores. SO

AFAM 192a / AFST 238a / AMST 238a / ER&M 238a, Third World Studies Gary Okihiro

Introduction to the historical and contemporary theories and articulations of Third World studies (comparative ethnic studies) as an academic field and practice. Consideration of subject matters; methodologies and theories; literatures; and practitioners and institutional arrangements. SO

AFAM 196a / AMST 196a / ER&M 226a / EVST 196a / SOCY 190a, Race, Class, and Gender in American Cities Laura Barraclough

Examination of how racial, gender, and class inequalities have been built, sustained, and challenged in American cities. Focus on the twentieth and twenty-first centuries. Topics include industrialization and deindustrialization, segregation, gendered public/private split, gentrification, transit equity, environmental justice, food access, and the relationships between public space, democracy, and community wellbeing. Includes field projects in New Haven. SO

* **AFAM 206a / ENGL 234a, Literature of the Black South** Sarah Mahurin

Examination of the intersections between African American and Southern literatures, with consideration of the ways in which the American South remains a space that simultaneously represents and repels an African American ethos. HU

* **AFAM 210b / AMST 445b / HIST 148Jb, Politics and Culture of the U.S. Color Line**
Matthew Jacobson

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 213a / AFST 481a / HIST 383Ja / HSHM 481a, Medicine and Race in the Slave Trade** Carolyn Roberts

Examination of the interconnected histories of medicine and race in the slave trade. Topics include the medical geography of the slave trade from slave prisons in West Africa to slave ships; slave trade drugs and forced drug consumption; mental and physical illnesses and their treatments; gender and the body; British and West African medicine and medical knowledge in the slave trade; eighteenth-century theories of racial difference and disease; medical violence and medical ethics. WR, HU

* **AFAM 216a / FILM 433a, Family Narratives/Cultural Shifts** Thomas Harris

This course looks at films that are redefining ideas around family and family narratives in relation to larger social movements. We focus on personal films by filmmakers who consider themselves artists, activists, or agents of change but are united in their use of the nonfiction format to speak truth to power. In different ways, these films use media to build community and build family and ultimately, to build family albums and archives that future generations can use to build their own practices. Just as the family album seeks to unite people across time, space, and difference, the films and texts explored in this course are also journeys that culminate in linkages, helping us understand nuances of identity while illuminating personal relationships to larger cultural, social, and historical movements. HU

* **AFAM 220b / FILM 434b, Archive Aesthetics and Community Storytelling** Thomas Harris

This production course explores strategies of archive aesthetics and community storytelling in film and media. It allows students to create projects that draw from archives – including news sources, personal narratives, and found archives – to produce collaborative community storytelling. Conducted as a production workshop, the course explores the use of archives in constructing real and fictive narratives across a variety of disciplines, such as – participants create and develop autobiographies, biographies, or fiction-based projects, tailored to their own work in film/new media around Natalie Goldberg’s concept that “our lives are at once ordinary and mythical.” HU

* **AFAM 227a / AMST 227a / ER&M 349a / HIST 137Ja, From the Voting Rights Act to #blacklivesmatter** Ferentz Lafargue

This course explores the period beginning from 1964 through the emergence of the #blacklivesmatter movement in 2013. Key concepts covered in this course include the Black Panther Party and rise of the Black Power movement; political campaigns of Shirley Chisholm, Jesse Jackson, and Barack Obama. The seminar concludes with an examination of the #blacklivesmatter movement and broader efforts addressing mass incarceration, poverty, and opportunity gaps in education. HU

* **AFAM 239a / AMST 461a / EDST 209a / ER&M 292a / WGSS 202a, 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. WR, HU

* **AFAM 246a / FILM 246a / THST 249a, Introduction to African American Cinema** Nicholas Forster

This course examines the history of African American cinema from the turn of the twentieth century through the present. In recent years, there has been a growing sense that, after decades of unequal hiring practices, black filmmakers have carved a space for artistic creation within Hollywood. This feeling was emboldened when Ryan Coogler's *Black Panther* became the highest grossing film of the 2018, seemingly heralding a new age of black-authored and black-focused cinema. This course examines the long history of black cinema that led to the financial and critical success of filmmakers like Coogler, Ava DuVernay, and Jordan Peele. In this course, we survey the expansive work of black American cinema and ask: is there such a category as black film/cinema? If so, is that category based on the director, the actor, the subject matter or ideology of the film? What political, aesthetic, social, and personal value does the category of black film/cinema offer? Some of the filmmakers include Barry Jenkins, Kathleen Collins, Spike Lee, Julie Dash,, Oscar Micheaux, Ava Duvernay, and Charles Burnett. HU

* **AFAM 247a / HUMS 216a / PLSC 282a, Democracy and Race in America: Thinking with Tocqueville and Du Bois** Giulia Oskian

Racial and economic inequalities have remained unsolved problems in American democracy since independence. For this reason, both historian Eric Foner and poet Amanda Gorman recently claimed that American democracy is still unfinished. To what extent and in what ways could pre-civil war America be considered democratic? What challenges did the democratic project face in the aftermath of the civil war and slave emancipation? How do these challenges still influence the American political life? This seminar addresses these questions with the two classical texts that are rarely read together: Alexis de Tocqueville's *Democracy in America* and W. E. B. Du Bois's *Black Reconstruction in America*. HU, SO

* **AFAM 253a / MUSI 381a, Jazz in Transition, 1960–2000** Michael Veal

A survey of musicians, stylistic currents, and critical issues relevant to the evolution of jazz between 1960 and 2000. Topics include Third Stream, free jazz, jazz-rock fusion, the influence of world music, neo-classicism, jazz and hip-hop, and others. HU

* **AFAM 259a / AMST 309a / EDST 255a, Education and Empire** Talya Zemach-Bersin

This course offers an introduction to the transnational history of education in relation to the historical development of the U.S. empire both at home and abroad. By bringing together topics often approached separately – immigration, education, race, colonialism, and the history of U.S. empire – we interrogate the ways that education has been mobilized to deploy power: controlling knowledge, categorizing and policing differences, administering unequal paths to citizenship/belonging, forcing assimilation,

promoting socio-economic divides, and asserting discipline and control. EDST 110 recommended. HU

* **AFAM 305b / ENGL 258b, African American Autobiography** Sarah Mahurin
Examination of African American autobiography, from slave narratives to contemporary memoirs, and how the genre approaches the project (and problem) of knowing, through reading, the relationships of fellow humans. Chronological consideration of a range of narratives and their representations of race, of space, of migration, of violence, of self, and of other, as well as the historical circumstances that inform these representations. Prerequisite: one college-level literature course. HU

* **AFAM 313b / THST 319b, Embodying Story** Staff
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. HU

* **AFAM 326a / AMST 312a / ER&M 310a / WGSS 298a, Postcolonial Cities of the West** Fadila Habchi
Examination of various texts and films pertaining to the representation of postcolonial cities in the global north and a range of social, political, and cultural issues that concern those who inhabit these spaces. HU

* **AFAM 331a / FILM 329a / THST 332a, Black Film and Theatre** Nicholas Forster
This course examines the numerous connections, networks, and associations between black film and black theatre across the latter half of the twentieth century. While there has been a resurgence of interest in black theatre on and off Broadway in recent years, we look at critical works created by black writers who created spaces, slid into the cracks, and opened wide the chasms of possibility between cinema and drama. We ask: how have black artists used these two mediums to articulate a political consciousness? How have black writers built, ruptured, and amended the demands required by cultural institutions like Broadway and Hollywood? We investigate the tensions between ideas of the universal and the specific, all the while attending to the complex and complicated possibilities across two different mediums: cinema and the stage. The question of authorship in the move from stage to screen will be omnipresent as we ask what kinds of performances are possible and what new worlds can be created in those transitions?
WR, HU

* **AFAM 342a / ENGL 239a / THST 239a, African American Drama through 1959**
Shane Vogel
This course surveys the formal development and major themes of African American drama from the antebellum period through 1959. We examine how dramatists and performers reimagined the various meanings of Blackness in the U.S. public sphere, as well as individual and collective acts of self-fashioning on and off the stage. Special attention is given to aesthetic experimentation and its relationship to political theater; transformations of genre and form; Black dramatic theory; historical drama; diasporic connections and disconnections; the relationship between music, dance, spectacle, and drama; anti-lynching drama and folk drama; representations of class, gender, and

sexuality; inter- and intra-racial conflict; Black radical theatre in the New Deal; and institutional histories of key Black theatre companies. HU

*** AFAM 348b / AMST 388b / ER&M 339b / WGSS 332b, James Baldwin 1964-1987: Transnationalism, Exile & Intimacy** Leah Mirakhor

The course explores Baldwin's oeuvre since 1964 until his death in 1987. As critics have noted, there has been a renaissance regarding the work of James Baldwin since 1999, with scholarly publications devoted to his work, public tributes, films, and publications of previously uncollected or out of print works. Critics had hailed Baldwin's earlier works – *Go Tell It on the Mountain*, *Giovanni's Room*, *Notes of a Native Son* – as his greatest literary accomplishments. After Baldwin's most celebrated work – *The Fire Next Time* – Baldwin appeared on the cover of *Time* magazine in 1963, under the heading "Birmingham and Beyond: The Negro's Push for Equality." In this moment, Baldwin became a celebrated public figure in the U.S. and beyond. Our class investigates the period after this height of celebrity, when critics lambasted him for being too political, too angry, too bitter, and losing narrative control and rigor. This two-decade span is significant because Baldwin was witness to the deaths and incarceration of Civil Rights leaders (whom he mourned as friends), the increased surveillance and incarceration of black activists, the Vietnam war, the emergence of Black Power, feminist movements, and gay and queer liberations. During this time, Baldwin lived primarily in Turkey and France, and continued to travel globally. Baldwin's essays, novels, speeches, and poetry wrestled with how to formally capture and witness the violences of imperialism, homophobia, and racism. Since his death, Baldwin's work has continued to influence and inform theoretical insights in American studies, literary studies, Black studies, and queer studies. Our class engages with Baldwin's formal practices, political contexts, and critical interpretations across these fields. Preference given to students with a background in African American Studies, WGGS, ERM, and American Studies. Previous readings of James Baldwin's works recommended but not required. HU

*** AFAM 352a / AMST 438a / ER&M 291a / LITR 295a / WGSS 343a, Caribbean Diasporic Literature** Fadila Habchi

An examination of contemporary literature written by Caribbean writers who have migrated to, or who journey between, different countries around the Atlantic rim. Focus on literature written in English in the twentieth and twenty-first centuries, both fiction and nonfiction. Writers include Caryl Phillips, Nalo Hopkinson, and Jamaica Kincaid. HU

*** AFAM 354a / ENGL 351a / HUMS 370a, Fictions of the Harlem Vogue: Novels, Short Stories, and Novellas of the "Harlem Renaissance"** Ernest Mitchell

In this seminar, we examine the major novels, short stories, and novellas of the Harlem Vogue (1923-1934), the first decade of the Negro Renaissance. Key texts by Jessie Fauset, Nella Larsen, Jean Toomer, and Eric Walrond are central, along with lesser-known works by Zora Neale Hurston and Langston Hughes. We consider critical debates about these texts and their standard designation as part of the "Harlem Renaissance." Careful close reading is emphasized throughout; students are guided through a process of archival research and sustained formal analysis to produce a polished critical essay. WR, HU

*** AFAM 364b / ENGL 277b, Blackness and the Problem** Staff

In *The Souls of Black Folk* (1903), W.E.B. Du Bois famously theorizes blackness as a serial confrontation with a fundamental question: "How does it feel to be a problem?"

This question is in many ways the organizing query of black studies and the devoted preoccupation of this class. Over the course of the semester, we undertake a sustained interrogation of the “problem” of being black, from the advent of racial slavery through to its manifold afterlives. Reading widely across a black literary and intellectual tradition spanning multiple centuries, genres, and disciplines, we explore how black writers not only bear witness to the evolution of the problem of being black over time, but also imagine its redress. Furthermore, we explore how blackness has been conceived as a problem not merely in the conventional sense of an unwelcome condition to be solved or overcome, but also a full and ethical way of dwelling in the world. HU

* **AFAM 384a / HIST 141J, Slavery, Race, and Yale** Crystal Feimster and Edward Rugemer

History of the relationship between Yale University and the institution of racial slavery in the United States, beginning with the founding of the University in 1701, through the era of the American Civil War, up to the end of the 19th century. The course also considers the historical relationship between the University and the Black community of New Haven, including the living memory of enslavement. WR, HU

* **AFAM 401a / AMST 411a / ER&M 385a / FILM 453a, Introduction to Documentary Studies** Matthew Jacobson

An introduction to documentary film, photography, and radio for students interested in doing documentary work, as well as for those who simply wish to study the history of the documentary as a cultural form. HU RP

* **AFAM 402a / RLST 435a, Black Religions in Slavery and Freedom** Nicole Turner

This course explores how enslaved and free black people created and sustained religious communities in the United States during the eras of slavery and freedom. It explores the resonances of African traditions, the role of conjure, Islam and Christianity in sustaining Black people through slavery and the transformations that developed after emancipation. The course challenges the paradigm of black religion as always pointing toward freedom while exploring how the transition in status from enslaved to free was reflected in and influenced by black religious practices and communities. This course explores the religious communities of the “slave quarters,” underground railroad, independent black churches on the political landscape of freedom through the end of the 19th century. This course aims to provide participants with a deeper exploration of the developments within the period from the 19th century through 1915 and the advent of Jim Crow and U.S. imperialism.

* **AFAM 410b, Interdisciplinary Approaches to African American Studies** Crystal Feimster

An interdisciplinary, thematic approach to the study of race, nation, and ethnicity in the African diaspora. Topics include class, gender, color, and sexuality; the dynamics of reform, Pan-Africanism, neocolonialism, and contemporary black nationalism. Use of a broad range of methodologies. WR, HU, SO

* **AFAM 412a / AMST 408a / ER&M 408a / THST 459a, Race and Comedy** Albert Laguna

Introduction to theories of the ludic and to critical race theory. Ways in which comic modes have been utilized by racialized subjects to represent and issue critiques of the dominant culture. Analysis of stand-up comedy, film, television, and novels. HU

*** AFAM 418a / GMAN 408a, Marx & Abolition Today** Cecilia Sebastian
 W.E.B. du Bois, C.L.R. James, Franz Fanon, Angela Davis, and Ruth Wilson Gilmore are just a few of the radical thinkers for whom Karl Marx's writings on history, capitalism, and revolution have provided both vehicle and object of critique in their efforts to end systems of racial oppression, including slavery, colonialism, imperialism, incarceration, and policing. This course explores the reception of Marx by abolitionist thinkers in combination with Marx's own writings on anti-slavery and anti-colonial struggles. We ask: How have abolitionist movements historically informed, expanded, and challenged Marxian theory and its tactical playbook? How, in turn, have anticommunist, racist, and security-statist ideologies been mobilized to undermine and defeat transformative social movements? Finally, how do contemporary struggles against racial domination within capitalist societies inform our grasp of these archives? While this course focuses on movement-based thinkers, including those mentioned above, we also read critical interventions in the Marxist intellectual tradition by Theodor Adorno, Cedric Robinson, Barbara and Karen Fields, and others. HU

*** AFAM 422b / HIST 132Jb, Plantation Societies in the Greater British Caribbean 1627-1761** Erin Trahey

This upper level writing and reading intensive seminar considers the development of 'slave societies' in the Greater British Caribbean region from 1627 to 1761. In this course, we explore the development and evolution of the plantation economies and societies of Barbados, Jamaica, and South Carolina, and the shift to a racialized form of slavery in America, first codified in the Barbados Slave Code of 1661. Drawing on a wide range of sources, we explore themes including: the Atlantic slave trade, the consolidation of African slavery in the Americas, divisions of labor on sugar and rice plantations, internal marketing economies, spiritual practices of the enslaved and slave resistance and revolt. WR, HU

*** AFAM 445b, Freedom(s) and Unfreedom(s): Slavery and Emancipation in the Atlantic World** Staff

This seminar explores slavery and emancipation over the eighteenth and nineteenth century. The system of racialized slavery prioritized white control. Sometimes this system allowed for the granting of privileges – to selected individuals – without jeopardizing white men's and women's control of Black people's labor through violent force. This seminar recognizes the purpose of racial slavery but seeks to examine how African and Afro-descended people carved out spaces, times, and kinds of freedom before emancipation. Further, it seeks to understand the limitation of Black peoples' visions of freedom when slavery was ended either by decree or force. This seminar disrupts a linear understanding of slavery and emancipation, that one day black people were enslaved and the next day they were not. We interrogate the meaning of freedom(s) and un-freedom(s) both before and after slavery was ended throughout the Americas. We read about Maroons, free people of color, enslaved people that worked in urban spaces and/or on plantations, and Black soldiers in order to better appreciate the ways in which these historical actors carved out spaces of freedom(s) during a time of almost universal unfreedom. WR, HU

*** AFAM 449b / AFST 449b / ENGL 378b, Challenges to Realism in Contemporary African Fiction** Stephanie Newell

Introduction to experimental African novels that challenge realist and documentary modes of representation. Topics include mythology, gender subversion, politics,

the city, migration, and the self. Ways of reading African and postcolonial literature through the lenses of identity, history, and nation. Formerly ENGL 449. WR, HU

*** AFAM 452b / HIST 145Jb, U.S. History Wars: Public History and the Battles Over the Past** Anna Duensing

This seminar introduces students to the theories and practices of public history in the U.S. context, exploring the possibilities and challenges of researching, crafting, and sharing historical narratives beyond the traditional confines of the classroom. Our focus lies in a series of charged topics and case studies—so called “battles over the past”—that shed light on contentious debates and ongoing problems in public history work. Students learn to think in greater depth about power and the production of history and the pitfalls produced by everyday peoples’ encounters with the past. In turn, they get a sense of how actors with a variety of overlapping and competing interests and investments—historians, educators, survivors, veterans, funders, descendants, activists, and organizers—have contributed to and significantly altered public engagement with the past. With a considerable focus on these last two groups, this course seeks to highlight the power of everyday people in addressing the long-term impact and erasures of anti-Black and racial-colonial violence in the United States and their grassroots efforts to expose the role of history itself in upholding white supremacy and the status quo. HU

*** AFAM 455b / EDST 340b / ER&M 438b, Anti-Racist Curriculum and Pedagogy**
Daniel HoSang

This seminar explores the pedagogical and conceptual tools, resources and frameworks used to teach about race and racism at the primary and secondary levels, across diverse disciplines and subject areas. Moving beyond the more limited paradigms of racial colorblindness and diversity, the seminar introduces curricular strategies for centering race and racism in ways that are accessible to students from a broad range of backgrounds, and that work to advance the overall goals of the curriculum. Prerequisite: ER&M 200 or an equivalent course addressing histories of race, ethnicity, and migration. SO

*** AFAM 456a / AMST 457a / WGSS 386a, American Abolition: From Slavery to Mass Incarceration** Micah Khater

This seminar is an interdisciplinary, historically-grounded examination of Black abolitionism in the United States from the mid-nineteenth century to the twenty-first century. Students engage deeply with readings in Black Feminist Theory, social and cultural history, literature, Disability Studies, and queer theory in order to investigate how abolitionist frameworks changed over time and, sometimes, remained the same. While this course focuses explicitly on Black activists who espoused abolitionism; it is important to remember that abolition did not always figure into the Black Freedom Struggle. As we navigate the expansion and contraction of abolitionism, we also consider why criminal justice *reform*, rather than abolition, was a central demand of Black political organizing. In order to better understand the complicated history of twenty-first century abolitionism—including its epistemological ties to histories of slavery—we engage with major paradigms in Black history. AFAM 162 is highly encouraged. HU

*** AFAM 459a / AMST 479a / ER&M 402a, The Displaced: Migrant and Refugee Narratives of the 20th and 21st Centuries** Leah Mirakhor

This course examines a series of transnational literary texts and films that illuminate how the displaced—migrants, exiles, and refugees— remake home away from their native countries. The twentieth and twenty-first centuries have produced massive displacements due to wars, genocides, racial, ethnic and religious conflicts, economic and climate change, among other factors. Our course focuses on several texts that explore questions of home, nation, and self in the context of specific historical events such as the Holocaust, civil rights movements in the U.S., internment, the Indian partition, African decolonization, and Middle Eastern/Arab ethno-religious conflicts and wars. We examine these events alongside the shifting legal and political policies and categories related to asylum, humanitarian parole, refugee, and illegal alien status. Exploring themes such as nostalgia, longing, trauma, and memory, we look at the possibilities and limitations of creating, contesting, and imagining home in the diaspora. Our objective is to debate and develop the ethical, political, geographic, and imaginative articulations of home in an era of mass displacements and geo-political crises. We examine how notions of home are imagined alongside and against categories of race, gender, and sexuality. HU

*** AFAM 471a and AFAM 472b, Independent Study: African American Studies** Aimee Cox

Independent research under the direction of a member of the department on a special topic in African American studies not covered in other courses. Permission of the director of undergraduate studies and of the instructor directing the research is required. A proposal signed 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, typically for an hour a week, and the student writes a final paper or a series of short essays. May be elected for one or two terms.

*** AFAM 479a / MUSI 480a, 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

*** AFAM 480a, Senior Colloquium: African American Studies** Staff

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 491a or b, The Senior Essay** Aimee Cox

Independent research on the senior essay. The senior essay form must be submitted to the director of undergraduate studies by the end of the second week of classes. The

senior essay should be completed according to the following schedule: (1) end of the sixth week of classes: a rough draft of the entire essay; (2) end of the last week of classes (fall term) or three weeks before the end of classes (spring term): two copies of the final version of the essay.

African Studies (AFST)

* AFST 015b / AFAM 016b / ENGL 015b, *South African Writing after Apartheid*

Stephanie Newell

An introduction to creative writing published in South Africa from the end of Apartheid in 1994 to the present. Close readings of contemporary fiction with additional material drawn from popular culture, including films, magazines, and music. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.

WR, HU

AFST 092a / THST 092a, *African Rhythm in Motion* Lacina Coulibaly

This first-year seminar traces the transnational migration of the polyrhythms inherent in African dance. Based in movement practice, the course considers the transformation of rhythm through time and space, moving from traditional African dances of the 20th century into the work of contemporary African artists and far-flung hybrid dance forms such as samba and tango. Part dance history, part introduction to the art of dance, the course is open to movers of all backgrounds and physical abilities. The professor works with students who require necessary adaptations of the physical material to meet special needs. Enrollment limited to first-year students. Preregistration required; see under First-year Seminar Program.

AFST 112b / ARCG 222b / NELC 112b / RLST 141b, *Egyptian Religion through the Ages* John Darnell

Diachronic approach to topics in Egyptian religion. Religious architecture, evidence for protodynastic cults, foreigners in Egyptian religious celebrations, music and vocal expression in Egyptian religion, Re and Osiris, the Amarna interlude and the Ramesside solar religion, and the goddess of the eye of the sun. Readings in translation.

HU

* AFST 135b / PLSC 135b, *Media and Conflict* Graeme Wood

The theory and practice of reporting on international conflict and war, and its relation to political discourse in the United States and abroad. Materials include case studies of media coverage of war in Europe, Africa, and the Middle East.

AFST 175a / PLSC 175a, *Africa in International Relations* David Simon

This course examines key facets of how African countries interact with the rest of the world, and with other countries on the continent. Focusing mostly on Sub-Saharan African countries, it looks at international economic relations (focusing on aid but also addressing trade, investment, and debt); peacemaking and peacebuilding; and regional governance institutions. SO

AFST 238a / AFAM 192a / AMST 238a / ER&M 238a, *Third World Studies* Gary Okihiro

Introduction to the historical and contemporary theories and articulations of Third World studies (comparative ethnic studies) as an academic field and practice.

Consideration of subject matters; methodologies and theories; literatures; and practitioners and institutional arrangements. SO

*** AFST 295a / ENGL 295a / LITR 461a, Postcolonial Ecologies** Cajetan Iheka

This seminar examines the intersections of postcolonialism and ecocriticism as well as the tensions between these conceptual nodes, with readings drawn from across the global South. Topics of discussion include colonialism, development, resource extraction, globalization, ecological degradation, nonhuman agency, and indigenous cosmologies. The course is concerned with the narrative strategies affording the illumination of environmental ideas. We begin by engaging with the questions of postcolonial and world literature and return to these throughout the semester as we read the primary texts, drawn from Africa, the Caribbean, and Asia. We consider African ecologies in their complexity from colonial through post-colonial times. In the unit on the Caribbean, we take up the transformations of the landscape from slavery, through colonialism, and the contemporary era. Turning to Asian spaces, the seminar explores changes brought about by modernity and globalization as well as the effects on both humans and nonhumans. Readings include the writings of Zakes Mda, Aminatta Forna, Helon Habila, Derek Walcott, Jamaica Kincaid, Ishimure Michiko, and Amitav Ghosh. WR, HU

*** AFST 324a / EP&E 317a / HIST 368Ja / PLSC 324a, Nelson and Winnie Mandela**
Jonny Steinberg

A study of Nelson and Winnie Mandela's marriage and public careers and the political and philosophical questions the marriage raises. Students examine the Mandelas' conflicting ideas on race and on the colonial experience and compare them to those of Mohandas Gandhi and Franz Fanon. Students also read recent philosophical work on forgiveness and on violence in order critically to assess the politics of reconciliation that so divided the Mandelas. The course examines the politics of global celebrity and the portrayal of men and women in public media.

AFST 340b / HIST 340b, Africa in the Era of the Slave Trade Staff

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

*** AFST 385a / EP&E 350a / HIST 391Ja / HLTH 385, Pandemics in Africa: From the Spanish Influenza to Covid-19** Staff

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 414b / FREN 414b / LITR 269b / MMES 261b, Afterlives of Algeria's Revolution** Jill Jarvis

The Algerian War for Independence from France was the longest and most violent decolonizing war of the 20th century. This war and its aftermath transformed political, social, intellectual, and artistic life on both sides of the Mediterranean—and it became a model for other decolonizing and civil rights movements across the world. Memory of this war continues to shape current debates in Europe and North Africa about state violence, terrorism, racism, censorship, immigration, feminism, human rights, and justice. Through study of fiction, film, testimonies, graphic novels, and theater, this seminar charts the war's surprising and enduring legacies. Films may include Pontecorvo's *The Battle of Algiers*, Haneke's *Caché*, and Panijel's *Octobre à Paris*. Literary works by Djébar, Camus, Sebbar, Etcherelli, Dib, Cixous, Kateb, Fanon, De Beauvoir, Mechakra. The course is conducted in French. If you have any questions about your French ability, contact the instructor. L5, HU

*** AFST 425b / FREN 425b / MMES 360b, North African French Poetry** Thomas Connolly

Introduction to North African poetry composed in French during the twentieth and twenty-first centuries. Works explored within the broader context of metropolitan French, Arabic, and Berber cultures; juxtaposition with other modes of expression including oral poetry, painting, dance, music, the Internet, and film. The literary, aesthetic, political, religious, and philosophical significance of poetic discourse. L5, HU

*** AFST 435a / THST 335a, West African Dance: Traditional to Contemporary** Lacinia 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 RP

*** AFST 443a / FREN 442a / LITR 484a / MMES 402a, Decolonizing Memory : Africa & the Politics of Testimony** Jill Jarvis

This seminar explores the politics and poetics of memory in a time of unfinished decolonization. It also provides students with a working introduction to anticolonial, postcolonial, and decolonial critique. Together we bring key works on the topics of state violence, trauma, and testimony into contact with literary works and films by artists of the former French and British empires in Africa. Reading literary and theoretical works together permits us to investigate archival silences and begin to chart a future for the critical study of colonial violence and its enduring effects. Literary readings may include works by Djébar, Rahmani, Ouologuem, Sebbar, Diop, Head, Krog. Films by Djébar,

Leuvre, Sembène, and Sissako. Theoretical readings may include works by Arendt, Azoulay, Césaire, Derrida, Fanon, Mbembe, Ng#g#, Spivak, and Trouillot. WR, HU

*** AFST 449b / AFAM 449b / ENGL 378b, Challenges to Realism in Contemporary African Fiction** Stephanie Newell

Introduction to experimental African novels that challenge realist and documentary modes of representation. Topics include mythology, gender subversion, politics, the city, migration, and the self. Ways of reading African and postcolonial literature through the lenses of identity, history, and nation. Formerly ENGL 449. WR, HU

*** AFST 481a / AFAM 213a / HIST 383Ja / HSHM 481a, Medicine and Race in the Slave Trade** Carolyn Roberts

Examination of the interconnected histories of medicine and race in the slave trade. Topics include the medical geography of the slave trade from slave prisons in West Africa to slave ships; slave trade drugs and forced drug consumption; mental and physical illnesses and their treatments; gender and the body; British and West African medicine and medical knowledge in the slave trade; eighteenth-century theories of racial difference and disease; medical violence and medical ethics. WR, HU

*** AFST 486b / HIST 374Jb / HSHM 486b, African Systems of Thought** Nana Osei Quarshie

This seminar explores the effects of colonialism and post-colonial power relations on the production of scientific, medical, and embodied knowledge about Africa. The course focuses on three broad themes covered across four units. First, we read debates over the nature and definition of science and tradition. How have colonialism and post-colonial power relations defined the tasks of an African science? What does it mean to decolonize African thought or culture? Second, we examine the nature of rationality. Is reason singular or plural? Culturally-bound or universal? To what extent are witchcraft, African healing practices, and ancestor veneration rational practices? Is there a “traditional” rationality? Third, we explore the relationship between scientific representations, social practices, and local culture. What relationship exists between social practices and culturally shared categories of knowledge? Lastly, we examine the intersection of capital and medical expertise. How have shifting conceptions of value and capital, reshaped scientific and medical authority in Africa? WR, HU

Akkadian (AKKD)

AKKD 110a, Elementary Akkadian I Staff

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 120b, Elementary Akkadian II Staff

Continuation of AKKD 110. Prerequisite: AKKD 110. L2 RP

American Sign Language (ASL)

ASL 110a, American Sign Language I Kristen Guynes and Julia Silvestri

An introduction to American Sign Language (ASL), with emphasis on vocabulary, ASL grammar, Deaf Culture and Conversational skills. Use of visual material (DVD), communicative activities, grammar drills, classifiers and Deaf Culture study. ASL 120 is not required to earn credit for ASL 110 L1 1½ Course cr

ASL 120b, 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 130a, American Sign Language III** Kristen Guynes and Julia Silvestri

Building on ASL 120, this course covers in depth the structure of ASL grammar, fingerspelling, narratives, and visual communication. Students develop expressive and receptive skills in storytelling and dialogue. Prerequisites: ASL 120 or a placement evaluation by professor. L3 1½ Course cr

* **ASL 140b, American Sign Language IV** Julia Silvestri

Building on ASL 130, this course increases the emphasis on more abstract and challenging conversational and narrative range; cultural values and behavioral rules of the deaf community in the U.S; receptive and expressive activities, including vocabulary, grammatical structures, and aspects of the Deaf Culture in debate format. Prerequisite: ASL 130; or as evaluated by professor. L4 1½ Course cr

American Studies (AMST)

* **AMST 021a / FILM 021a, Sports and Media** Charles Musser

This course develops critical thinking about sports in contemporary media culture. The social aspect of playing, watching, and talking about sports has always involved media; media likewise inflect the meaning of athletic events. “Media” here designates cinema, television, radio, print, and social media. We analyze the ways mass media and sports have shaped identity: gender, race, class, age, geography, and ideology. The background for considering these social phenomena is a general understanding of the commercial and civic nature of major sports, although some attention is also paid to amateur media and alternative sports. Our scope extends from the U.S. toward the globe, observing how international networks (Olympics, World Cup) act in specific national cultures. Principal readings are drawn from recent scholarship on sports and media, and criticism of films. Historically significant and contemporary films introduce the history of sports in media culture, from the *Corbett-Courtney Fight* (1894) to *Rocky*, *Paper Lion*, *The Armstrong Lie*, *Invictus*, *Venus and Serena*, and *Chariots of Fire*. Classroom

activities include mini-lectures, discussion, group analysis of texts, and brief student presentations. WR, HU

*** AMST 029b / ENGL 029b, 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. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.

HU

*** AMST 030b, Cultures of Travel** Talya Zemach-Bersin

From where does the desire to leave the familiar and experience the unknown emerge? What is the relationship between travel and the production of knowledge? What are the cultural politics of constructing, selling, and consuming "experiences" of alterity? In what ways is tourism today linked to historically constituted systems of power and inequality? This interdisciplinary course draws on anthropology, history, literary criticism, and feminist, postcolonial, and critical theory to examine the social construction of travelers and the making of knowledge and power through travel. We examine the processes through which displacement and travel yield normalized claims to knowledge, enhanced selfhood, and professional expertise. Through engagement with theoretical texts, case studies, and primary documents, we think critically about privileged discourses of travel. Major course themes include the politics of authenticity, the mythic figure of the traveler, the valorization of displacement as aesthetic gain, the fantasy of "going native," patterns of consumption, and the pervasive links between travel, authority, power, and knowledge. Students are encouraged to engage their own research interests and to theorize themselves as both travelers and knowledge-producers. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** AMST 031a / WGSS 031a, LGBTQ Spaces and Places** Terrell 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. HU

*** AMST 032a, Gender, Sexuality, and U.S. Empire** Talya Zemach-Bersin

This course explores the cultural history of America's relationship to the world across the long twentieth century with particular attention to the significance of gender, sexuality, and race. We locate U.S. culture and politics within an international dynamic, exposing the interrelatedness of domestic and foreign affairs. While exploring specific geopolitical events like the Spanish-American War, World War I and II, and the Cold War, this course emphasizes the political importance of culture and ideology rather

than offering a formal overview of U.S. foreign policy. How have Americans across the twentieth century drawn from ideas about gender to understand their country's relationship to the wider world? In what ways have gendered ideologies and gendered approaches to politics shaped America's performance on the world's stage? How have geopolitical events impacted the construction of race and gender on the home front? In the most general sense, this course is designed to encourage students to understand American cultural and gender history as the product of America's engagement with the world. In so doing, we explore the rise of U.S. global power as an enterprise deeply related to conceptions of race, sexuality, and gender. We also examine films, political speeches, visual culture, music, and popular culture. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

*** AMST 090b, Politics and Culture of Race in America** Matthew Jacobson
An interdisciplinary investigation of race in American life in the long twentieth century, including attention to politics, political economy, law, criminal justice, literature, and the arts. Encompassing a chronological scope from post-Reconstruction to the Obama and Trump years, the course considers Jim Crow, US empire, indigeneity, immigration, the long Civil Rights era, neoliberalism, white nationalism, and the powerful antiracist and pro-democratic currents in American thought. Texts include scholarly works, as well as primary works by novelists, poets, journalists, memoirists, photographers, film makers, and graphic novelists and cartoonists. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU RP

*** AMST 095a / ER&M 095a / SAST 061a / THST 095a, South Asian American Theater and Performance** Shilarna Stokes
South Asian Americans have appeared on U.S. stages since the late nineteenth century, yet only in the last quarter century have plays and performances by South Asian Americans begun to dismantle dominant cultural representations of South Asian and South Asian American communities and to imagine new ways of belonging. This seminar introduces you to contemporary works of performance (plays, stand-up sets, multimedia events, and more) written and created by U.S.-based artists of South Asian descent as well as artists of the South Asian diaspora whose works have had an impact on U.S. audiences. With awareness that the South Asian American diaspora comprises multiple, contested, and contingent identities, we investigate how artists have worked to manifest complex representations of South Asian Americans onstage, challenge institutional and professional norms, and navigate the perils and pleasures of becoming visible. HU

AMST 116b / RLST 115b, How to Build an American Religion Kathryn Lofton
How communities can be organized through code, charisma, ritual, and cosmology. Topics include strategies for concretizing utopia and establishing communal principles, expanding audiences, and specifying creed. This course serves as an introduction to religion through theoretical readings and specific examples drawn from the transnational American scene, past and present. Discussion of particular leaders, sects, practices, and media will offer insights into how ideas organize societies and individuals establish themselves as icons. Students adapt strategies taught in the course in order to practice their own capacity to foster social movements, develop and critique brands, and consider the relationship between religion, politics, and economy. HU

AMST 133b / ER&M 187b / HIST 107b, Introduction to American Indian History

Ned Blackhawk

Survey of American Indian history, beginning with creation traditions and migration theories and continuing to the present day. Focus on American Indian nations whose homelands are located within the contemporary United States. Complexity and change within American Indian societies, with emphasis on creative adaptations to changing historical circumstances. HU

AMST 134a / ER&M 264a / SOCY 134a / WGSS 110a, Sex and Gender in Society

Rene Almeling

Introduction to the social processes through which people are categorized in terms of sex and gender, and how these social processes shape individual experiences of the world. Sex and gender in relation to race/ethnicity, class, sexuality, nationality, education, work, family, reproduction, and health. SO

AMST 162b / AFAM 162b / HIST 187b, African American History from Emancipation to the Present

Elizabeth Hinton

An examination of the African American experience since 1861. Meanings of freedom and citizenship are distilled through appraisal of race and class formations, the processes and effects of cultural consumption, and the grand narrative of the civil rights movement. WR, HU

*** AMST 184a / ENGL 437a / HUMS 184a, 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

AMST 196a / AFAM 196a / ER&M 226a / EVST 196a / SOCY 190a, Race, Class, and Gender in American Cities

Laura Barraclough

Examination of how racial, gender, and class inequalities have been built, sustained, and challenged in American cities. Focus on the twentieth and twenty-first centuries. Topics include industrialization and deindustrialization, segregation, gendered public/private split, gentrification, transit equity, environmental justice, food access, and the relationships between public space, democracy, and community wellbeing. Includes field projects in New Haven. SO

AMST 197b / ARCH 280b / HSAR 219b / URBN 280b, American Architecture and Urbanism

Elihu Rubin

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

AMST 199a / HIST 165a, The American Century Beverly Gage

United States politics, political thought, and social movements in the 20th century. Pivotal elections and political figures (Wilson, Roosevelt, Nixon, Reagan) as well as politics from below (civil rights, labor, women's activism). Emphasis on political ideas such as liberalism, conservatism, and radicalism, and on the intersection between domestic and foreign affairs. Primary research in Yale archival collections. Students who have already completed HIST 136J must have the instructor's permission to enroll in this course, and will perform alternate readings during some weeks. HU

AMST 209b / ER&M 223b / PLSC 262b, Race, Politics, and the Law Daniel HoSang

Examination of how race – as a mode of domination and resistance – has developed and transformed in the United States since the early-twentieth-century. How political actors and social movements engage the law to shape visions of freedom, democracy, and political life. Consideration of critical race theory, political discourse analysis, intersectionality and women of color feminism, and American political development. SO

AMST 215a / HIST 485a / HSHM 217a / HUMS 219a, Biomedical Futures and Michael Crichton's Monsters Joanna Radin

What forms of life have been produced by modern science? The literal life-changing technologies that began to emerge after the Second World War also provoked new anxieties. They expressed themselves in the speculative fiction of Michael Crichton in terms of monsters: the virus in *The Andromeda Strain*, the androids in *Westworld*, the velociraptors of *Jurassic Park*, and even the patients maimed by gunshot wounds in *ER*. Crichton wrote thrilling stories that also asked his readers to consider what monsters humans could make if they didn't stop to consider whether or not they should. This course examines the emergence of modern life science to consider what it would take to produce more life-sustaining futures. HU, SO

*** AMST 227a / AFAM 227a / ER&M 349a / HIST 137Ja, From the Voting Rights Act to #blacklivesmatter** Ferentz Lafargue

This course explores the period beginning from 1964 through the emergence of the #blacklivesmatter movement in 2013. Key concepts covered in this course include the Black Panther Party and rise of the Black Power movement; political campaigns of Shirley Chisholm, Jesse Jackson, and Barack Obama. The seminar concludes with an examination of the #blacklivesmatter movement and broader efforts addressing mass incarceration, poverty, and opportunity gaps in education. HU

AMST 236b / EVST 318b / HIST 199b / HSHM 207b, American Energy History Paul Sabin

The history of energy in the United States from early hydropower and coal to present-day hydraulic fracturing, deepwater oil, wind, and solar. Topics include energy transitions and technological change; energy and democracy; environmental justice and public health; corporate power and monopoly control; electricity and popular culture; labor struggles; the global quest for oil; changing national energy policies; the climate crisis. WR, HU

AMST 238a / AFAM 192a / AFST 238a / ER&M 238a, Third World Studies Gary Okihiro

Introduction to the historical and contemporary theories and articulations of Third World studies (comparative ethnic studies) as an academic field and practice.

Consideration of subject matters; methodologies and theories; literatures; and practitioners and institutional arrangements. SO

*** AMST 245a / ENGL 246a / PLSC 247a, The Media and Democracy** Joanne Lipman

In an era of "fake news," when mainstream media is attacked as the "enemy of the people" and social platforms are enabling the spread of misinformation, how do journalists hold power to account? Students explore topics including objectivity versus advocacy, and hate speech versus First Amendment speech protections. Case studies will span from 19th century yellow journalism to the media's role in #MeToo and #BlackLivesMatter movements. SO

AMST 272a / ER&M 282a / HIST 183a / WGSS 272a, Asian American History, 1800 to the Present Mary Lui

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

*** AMST 280a, Law and Legal History for the Interdisciplinary Humanities** Greta LaFleur

This course introduces students to how to use and make sense of legal sources: statutes, judicial opinions, legislative actions, legal studies, administrative rulings, and legal history, among others. This course is intended for undergraduates who are interested in incorporating law and legal research into their scholarship, from final papers to senior theses. The course is divided into two "units." The first unit works with statutory and common law, and instructs students on how to think with and interpret these sources, especially as legal thought has distinct and often very rigid approaches to statutory and judicial sources. The second unit explores legal history – both the origins of U.S. American legal thought and structures – but we also delve into legal history itself, focusing on three case studies: the laws and court structures that codified slavery; the laws and legal structures that enacted and justified settler colonialism, settler land claims, the development of the federal administrative structure that controls Native lands, and tribal courts; and the laws and delegation of powers that structure (and continue to structure) immigration. These case studies are in no way meant to offer a comprehensive account of U.S. American legal history, or to offer a totalizing or full account of slavery, immigration, or settler colonialism. Rather, they are an opportunity for students to get direct experience with reading and interpreting the law; with legal research and the distinct architecture of sources for performing that research (Westlaw, Lexis, HeinOnline); and with scholarship in legal history and legal studies. Throughout the course, we also reflect more broadly on what legal sources and legal history is good for, and what it might simultaneously occlude. Finally, we explore the form and function of the law itself: what it does, what it cannot do, and how those who sought or seek to change it have strategically approached the promises and disappointments of legal reform and intervention. HU

*** AMST 281b / ENGL 278b, Antebellum American Literature** Michael Warner

Introduction to writing from the period leading up to and through the Civil War. The growth of African American writing in an antislavery context; the national book market and its association with national culture; emergence of a language of environment;

romantic ecology and American pastoral; the "ecological Indian"; evangelicalism and the secular; sentimentalism and gender; the emergence of sexuality; poetics. WR, HU

AMST 284b / ER&M 217b, Introduction to Latinx Studies Albert Laguna

Themes and issues that have shaped the experiences of Latino/a populations in the United States explored within an interdisciplinary and hemispheric framework. Relations between the United States and Latin America; the history of ethnic labels; the formation of transnational communities and identities; the politics of language and bilingualism; race, class, and ethnicity; and gender and sexuality. HU

* **AMST 286b / AFAM 182b / ENGL 182b / HUMS 241b, James Baldwin's American Scene** Jacqueline Goldsby

In-depth examination of James Baldwin's canon, tracking his work as an American artist, citizen, and witness to United States society, politics, and culture during the Cold War, the Civil Rights era, and the Black Arts Movement. HU

AMST 299b / ER&M 299b / HIST 166b, The History of Right Now Matthew Jacobson

Historiographic narrative of United States history over the past century and critical/methodological practices of thinking historically and of identifying ways in which our present has been conditioned by historical legacies, both momentous and subtle. Topics include the New Deal, WWII, the arms race, Reaganomics, and 9/11 in terms of their lasting influence on American conditions in the present. HU RP

* **AMST 301a / ER&M 382a / HIST 325Ja, Researching Mexican American Histories** Stephen Pitti

A survey of recent scholarship on Mexican American history. Students write a research paper based on primary sources and explore issues related to migration, education, detention, religion, urban communities, ethnic politics, and youth activism since the mid-nineteenth century. Reading knowledge of Spanish preferred. HU

* **AMST 309a / AFAM 259a / EDST 255a, Education and Empire** Talya Zemach-Bersin

This course offers an introduction to the transnational history of education in relation to the historical development of the U.S. empire both at home and abroad. By bringing together topics often approached separately – immigration, education, race, colonialism, and the history of U.S. empire – we interrogate the ways that education has been mobilized to deploy power: controlling knowledge, categorizing and policing differences, administering unequal paths to citizenship/belonging, forcing assimilation, promoting socio-economic divides, and asserting discipline and control. EDST 110 recommended. HU

* **AMST 312a / AFAM 326a / ER&M 310a / WGSS 298a, Postcolonial Cities of the West** Fadila Habchi

Examination of various texts and films pertaining to the representation of postcolonial cities in the global north and a range of social, political, and cultural issues that concern those who inhabit these spaces. HU

* **AMST 314b / ER&M 314b / WGSS 306b, Gender and Transgender** Greta LaFleur

Introduction to transgender studies, an emergent field that draws on gender studies, queer theory, sociology, feminist science studies, literary studies, and history. Representations of gender nonconformity in a cultural context dominated by a two-sex

model of human gender differentiation. Sources include novels, autobiographies, films, and philosophy and criticism. RP

* **AMST 319b / ENGL 327b, The Modernist Novel in the 1920s** Joe Cleary

Many of the classics of modernist fiction were published between 1920 and 1930. These novels did not come into the world as “modernist”; that term was later conferred on narrative experiments often considered bizarre at the time. As writers, the “modernists” did not conform to pre-existing social conceptions of “the writer” nor work with established systems of narrative genres; rather, they tried to remake the novel as form and bend it to new purposes. This course invites students to consider diverse morphologies of the Anglophone modernist novel in this decade and to reflect on its consequences for later developments in twentieth-century fiction. The seminar encourages careful analyses of individual texts but engages also with literary markets, patronage systems, changing world literary systems, the rise of cinema and mass and consumer cultures, and later Cold War constructions of the ideology of modernism.

WR, HU

* **AMST 332b / HSAR 410b, Humbugs and Visionaries: American Artists and Writers Before the Civil War** Bryan Wolf

This course examines American literature and visual culture of the seventeenth, eighteenth, and nineteenth centuries. We look in particular at outliers, prophets, and self-promoters, from the radical Puritan writer Anne Bradstreet to popular entertainers like P. T. Barnum. Topics include: visibility and the public sphere; landscape and politics; genre painting and hegemony; race and identity; managerial culture and disembodied vision. Class trips to the Yale University Art Gallery and the Metropolitan Museum (New York). HU

* **AMST 336a / WGSS 335a, LGBTQ Life Spans** Terrell 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 345a / ER&M 409a / WGSS 408a, Latinx Ethnography** Ana Ramos-Zayas

Consideration of ethnography within the genealogy and intellectual traditions of Latinx Studies. Topics include: questions of knowledge production and epistemological traditions in Latin America and U.S. Latino communities; conceptions of migration, transnationalism, and space; perspectives on “(il)legality” and criminalization; labor, wealth, and class identities; contextual understandings of gender and sexuality; theorizations of affect and intimate lives; and the politics of race and inequality under white liberalism and conservatism in the United States. SO

* **AMST 346b / ENGL 235b / HUMS 252b, Poetry and Objects** Karin Roffman

This course on 20th and 21st century poetry studies the non-symbolic use of familiar objects in poems. We meet alternating weeks in the Beinecke library archives and the Yale Art Gallery objects study classroom to discover literary, material, and biographical histories of poems and objects. Additionally, there are scheduled readings and discussions with contemporary poets. Assignments include both analytical essays and the creation of online exhibitions. WR, HU

* **AMST 348b / ER&M 381b / EVST 304b, Space, Place, and Landscape** Laura Barraclough

Survey of core concepts in cultural geography and spatial theory. Ways in which the organization, use, and representation of physical spaces produce power dynamics related to colonialism, race, gender, class, and migrant status. Multiple meanings of home; the politics of place names; effects of tourism; the aesthetics and politics of map making; spatial strategies of conquest. Includes field projects in New Haven. SO

* **AMST 349a / THST 427a, Technologies of Movement Research** Emily Coates

An interdisciplinary survey of creative and critical methods for researching human movement. Humans move to communicate, to express emotions, to commune, to protest, to reflect and embody the natural world. Drawing on an array of artistic projects and scholarship (in dance and performance studies, art, anthropology, sociology, philosophy, cognitive science, and the history of science), we consider case studies that take up movement as both the object and method of inquiry. Class time and assignments include moving, reading, and watching. Movement exercises are adaptable to the remote environment. All physical capabilities are welcome; no prior experience in dance required. Limited enrollment. See Syllabus page on Canvas for application.

* **AMST 356a / RLST 215a, Celebrity, Politics, Power** Kathryn Lofton

This course uses celebrity to think about American political power. Informed by American studies, gender studies, and religious studies, the course considers celebrity a way to talk about how popularity is an embodied and spiritualized appraisal. The bibliography on celebrity and politics is not a robust one, despite the fact that winning elections requires popularity and in the last twenty years of American politics some conscientiousness of the skill sets celebrities mastered seems a precondition for electoral success. The course assembles a range of scholarly and archival resources to think about what it means to achieve celebrity, and how it is a political form of public life. Of particular interest is how to think about the construction of magic and charisma, and how those very idioms often contribute to accusations of mesmerism and manipulation. Written assignments focus students on developing celebrity as an applied knowledge for social media development and political progress. HU

* **AMST 370a or b / THST 380a or b, Choreographic Invention in 20th Century America** Brian Seibert

An examination of major movements in the history of concert and social dance from the late nineteenth century to the present, including ballet, tap, jazz, modern, musical theater, and different cultural forms. Topics include tradition versus innovation, the influence of the African diaspora, and interculturalism. Exercises are used to illuminate analysis of the body in motion. Limited enrollment. See Canvas for details. WR, HU

* **AMST 379b / ENGL 371b / FREN 371b / LITR 477b, Fictions of Canada:**

Colonialism, Nationalism, Postcolonialism Katie Trumpener

This seminar explores the literature(s) of Canada in its long history, its considerable linguistic and cultural range, and its complex relationship to political history. 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. Particular focus on Canada's diverse early literatures (from Jesuit hymn to epistolary novel); on the prominent role of women writers across Canadian literature history; on the emergence of an experimental Québécois literature (utilizing Montreal patois as a new literary language) in an era also marked by secularization, modernization and political separatism; of English Canadian attempts to rethink colonial history, and the critiques of Canada's ongoing decolonization process by new generations of indigenous, immigrant and ethnic writers. This course explores both literary history and literary form; the work of internationally famous novelists and poets (Leonard Cohen, Marie-Claire Blais, Margaret Atwood, Alice Munro, Michael Ondaatje) and their innovative local counterparts. Throughout the semester, moreover, our discussion of written literary texts (poems, novels, plays) is supplemented by primarily oral texts, Canadian anthems, ballads, folk, rock and punk songs in a range of Canadian languages). We will thus listen to even as we read Canada. WR, HU

* **AMST 382a / WGSS 372a, Theory and Politics of Sexual Consent** Joseph Fischel

Political, legal, and feminist theory and critiques of the concept of sexual consent. Topics such as sex work, nonnormative sex, and sex across age differences explored through film, autobiography, literature, queer commentary, and legal theory. U.S. and Connecticut legal cases regarding sexual violence and assault. SO

* **AMST 388b / AFAM 348b / ER&M 339b / WGSS 332b, James Baldwin 1964-1987:**

Transnationalism, Exile & Intimacy Leah Mirakhor

The course explores Baldwin's oeuvre since 1964 until his death in 1987. As critics have noted, there has been a renaissance regarding the work of James Baldwin since 1999, with scholarly publications devoted to his work, public tributes, films, and publications of previously uncollected or out of print works. Critics had hailed Baldwin's earlier works—*Go Tell It on the Mountain*, *Giovanni's Room*, *Notes of a Native Son*—as his greatest literary accomplishments. After Baldwin's most celebrated work—*The Fire Next Time*—Baldwin appeared on the cover of *Time* magazine in 1963, under the heading "Birmingham and Beyond: The Negro's Push for Equality." In this moment, Baldwin became a celebrated public figure in the U.S. and beyond. Our class investigates the period after this height of celebrity, when critics lambasted him for being too political, too angry, too bitter, and losing narrative control and rigor. This two-decade span is significant because Baldwin was witness to the deaths and incarceration of Civil Rights leaders (whom he mourned as friends), the increased surveillance and incarceration of black activists, the Vietnam war, the emergence of Black Power, feminist movements, and gay and queer liberations. During this time, Baldwin lived primarily in Turkey and France, and continued to travel globally. Baldwin's essays, novels, speeches, and poetry wrestled with how to formally capture and witness the violences of imperialism, homophobia, and racism. Since his death, Baldwin's work has continued to influence and inform theoretical insights in American studies, literary studies, Black studies, and queer studies. Our class engages with Baldwin's formal practices, political contexts, and critical interpretations across these fields. Preference given to students with

a background in African American Studies, WGSS, ERM, and American Studies. Previous readings of James Baldwin's works recommended but not required. HU

* **AMST 408a / AFAM 412a / ER&M 408a / THST 459a, Race and Comedy** Albert Laguna

Introduction to theories of the ludic and to critical race theory. Ways in which comic modes have been utilized by racialized subjects to represent and issue critiques of the dominant culture. Analysis of stand-up comedy, film, television, and novels. HU

* **AMST 411a / AFAM 401a / ER&M 385a / FILM 453a, Introduction to Documentary Studies** Matthew Jacobson

An introduction to documentary film, photography, and radio for students interested in doing documentary work, as well as for those who simply wish to study the history of the documentary as a cultural form. HU RP

* **AMST 422b / ER&M 435b / HIST 151Jb, Writing Tribal Histories** Ned Blackhawk
Historical overview of American Indian tribal communities, particularly since the creation of the United States. Challenges of working with oral histories, government documents, and missionary records. WR, HU

* **AMST 427a / PLSC 269a / WGSS 427a, Politics of Gender and Sexuality in the United States** Dara Strolovitch

The 2016 Presidential election made clear that gender matters a great deal in American politics, but it also revealed that *how* gender matters is far from obvious. This course explores the ways in which gender and sexuality shape and are shaped by American politics and public policy. We explore the history, findings, and controversies in research about gender and sexuality in American politics from a range of approaches, examining what political science research helps us understand about questions such as: Does gender influence political campaigns and whether people will vote for particular candidates? Once elected, are gender and sexuality related to legislators' behavior in office? How are norms related to race, class, gender, and sexuality reflected in and constructed by public policy? We also explore feminist, queer, and intersectional theories and methodologies and important work from other disciplines and interdisciplines, paying particular attention to the implications of intersectionality for understanding gender, sexuality, and politics. We also analyze the ways in which gender and sexuality intersect with other politically salient categories, identities, and forms of marginalization, including race, ethnicity, class, and ideological and partisan identification, paying particular attention to their implications for the 2016, 2018, and 2020 elections. SO

* **AMST 435b / ANTH 366b, Inequality in America** Kathryn Dudley

Sociocultural dimensions of social inequality in the contemporary United States. Ways in which the socioeconomic processes that produce inequality are inextricably embedded in worlds of cultural meaning; how those meanings are constructed and embodied in everyday practice. Perspectives from anthropology, sociology, economics, history, and popular media. SO

* **AMST 438a / AFAM 352a / ER&M 291a / LITR 295a / WGSS 343a, Caribbean Diasporic Literature** Fadila Habchi

An examination of contemporary literature written by Caribbean writers who have migrated to, or who journey between, different countries around the Atlantic rim. Focus on literature written in English in the twentieth and twenty-first centuries, both

fiction and nonfiction. Writers include Caryl Phillips, Nalo Hopkinson, and Jamaica Kincaid. HU

*** AMST 439a / ER&M 439a, Fruits of Empire** Gary Okihiro

Readings, discussions, and research on imperialism and "green gold" and their consequences for the imperial powers and their colonies and neo-colonies. Spatially conceived as a world-system that enmeshes the planet and as earth's latitudes that divide the temperate from the tropical zones, imperialism as discourse and material relations is this seminar's focus together with its implantations—an empire of plants. Vast plantations of sugar, cotton, tea, coffee, bananas, and pineapples occupy land cultivated by native and migrant workers, and their fruits move from the tropical to the temperate zones, impoverishing the periphery while profiting the core. Fruits of Empire, thus, implicates power and the social formation of race, gender, sexuality, class, and nation. HU, SO

*** AMST 445b / AFAM 210b / HIST 148Jb, Politics and Culture of the U.S. Color Line**

Matthew Jacobson

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 447b / EDST 270b / ER&M 367b, Contemporary Native American K-12 and Postsecondary Educational Policy** Matthew Makomenaw

This course will explore current 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 110 recommended SO

*** AMST 452b / ER&M 452b, Movement, Memory, and U.S. Settler Colonialism**

Laura Barraclough

This research seminar examines and theorizes the significance of movement and mobility in the production and contestation of settler colonial nation-states. To do so, it brings together the fields of settler colonial studies, critical indigenous studies, ethnic studies, public history, and mobility studies. After acquainting ourselves with the foundations and some of the key debates within each of these fields, we examine four case studies: The Freedom Trail and the Black Heritage Trail in Boston; the Lewis and Clark expedition and its recuperation as a site of healing and education for tribal nations in the Upper Midwest and Northwest; the Trail of Tears and the contest over southern memory; and the relationships between settlement, labor migration, and regional racial formation in California. Students then conduct their own research projects that integrate primary source research on a particular organized movement (of people, non-human animals, ideas, practices) with two or more expressions of memory about that movement (in the form of public history installations, popular culture, literature, music, digital memes, etc.). This course is best suited to students who have initial ideas about a potential research topic and are exploring related ideas for their senior essay. HU

* **AMST 453a / HIST 119Ja, 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 457a / AFAM 456a / WGSS 386a, American Abolition: From Slavery to Mass Incarceration** Micah Khater

This seminar is an interdisciplinary, historically-grounded examination of Black abolitionism in the United States from the mid-nineteenth century to the twenty-first century. Students engage deeply with readings in Black Feminist Theory, social and cultural history, literature, Disability Studies, and queer theory in order to investigate how abolitionist frameworks changed over time and, sometimes, remained the same. While this course focuses explicitly on Black activists who espoused abolitionism; it is important to remember that abolition did not always figure into the Black Freedom Struggle. As we navigate the expansion and contraction of abolitionism, we also consider why criminal justice *reform*, rather than abolition, was a central demand of Black political organizing. In order to better understand the complicated history of twenty-first century abolitionism – including its epistemological ties to histories of slavery – we engage with major paradigms in Black history. AFAM 162 is highly encouraged. HU

* **AMST 461a / AFAM 239a / EDST 209a / ER&M 292a / WGSS 202a, 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. WR, HU

* **AMST 462b / ER&M 462b / WGSS 463b, The Study of Privilege in the Americas**
Ana Ramos-Zayas

Examination of inequality, not only through experiences of the poor and marginal, but also through institutions, beliefs, social norms, and everyday practices of the privileged. Topics include: critical examination of key concepts like “studying up,” “elite,” and “privilege,” as well as variations in forms of capital; institutional sites of privilege (elite prep schools, Wall Street); living spaces and social networks (gated communities, private clubs); privilege in intersectional contexts (privilege and race, class, and gender); and everyday practices of intimacy and affect that characterize, solidify, and promote privilege. SO

*** AMST 463a / EVST 463a / FILM 455a / THST 457a, 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 471a and AMST 472b, 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 479a / AFAM 459a / ER&M 402a, The Displaced: Migrant and Refugee Narratives of the 20th and 21st Centuries** Leah Mirakhor

This course examines a series of transnational literary texts and films that illuminate how the displaced—migrants, exiles, and refugees—remake home away from their native countries. The twentieth and twenty-first centuries have produced massive displacements due to wars, genocides, racial, ethnic and religious conflicts, economic and climate change, among other factors. Our course focuses on several texts that explore questions of home, nation, and self in the context of specific historical events such as the Holocaust, civil rights movements in the U.S., internment, the Indian partition, African decolonization, and Middle Eastern/Arab ethno-religious conflicts and wars. We examine these events alongside the shifting legal and political policies and categories related to asylum, humanitarian parole, refugee, and illegal alien status. Exploring themes such as nostalgia, longing, trauma, and memory, we look at the possibilities and limitations of creating, contesting, and imagining home in the diaspora. Our objective is to debate and develop the ethical, political, geographic, and imaginative articulations of home in an era of mass displacements and geo-political crises. We examine how notions of home are imagined alongside and against categories of race, gender, and sexuality. HU

*** AMST 484a / ER&M 405a / FILM 402a / HSAR 493a / WGSS 462a, Visual Kinship, Families, and Photography** Laura Wexler

Exploration of the history and practice of family photography from an interdisciplinary perspective. Study of family photographs from the analog to the digital era, from snapshots to portraits, and from instrumental images to art exhibitions. Particular attention to the ways in which family photographs have helped establish gendered and racial hierarchies and examination of recent ways of reconceiving these images. HU

*** AMST 487a / PLSC 275a, The Rise of “Presidentialism” in the United States**

Stephen Skowronek

This course is about the rise and makeshift character of “presidentialism” in the United States. It will examine different sources of power that have, singly and in combination, put the presidency at the center of government and politics. These include: 1) popular power: in elections, public opinion, parties, and social movements; 2) institutional power: in control of the executive branch, military command, and war making. Readings will delve into cases in which each of these sources of power figured prominently. In every particular, the seminar will consider the strains that this power

has put on the constitutional frame. For advanced undergraduates, or by permission
SO

* **AMST 491a 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 493a and AMST 494b, Senior Project for the Intensive Major** Laura Wexler

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 110a, 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 120. No prior knowledge of Greek assumed. L1 RP 1½ Course cr

GREK 120b, Beginning Greek: Review of Grammar and Selected Readings Staff

Continuation of GREK 110. Emphasis on consolidating grammar and on readings from Greek authors. The sequence GREK 110, 120 prepares for 131 or 141. Prerequisite: GREK 110 or equivalent. L2 RP 1½ Course cr

* **GREK 125b, 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 131a, Greek Prose: An Introduction Pauline LeVen

Close reading of selections from classical Greek prose with review of grammar. Counts as L4 if taken after GREK 141 or equivalent. L3

GREK 141b, 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 131 or equivalent. L3

* **GREK 421b, Apollonius' Argonautica** Staff

Apollonius of Rhodes' *Argonautica* is the only extant large-scale narrative epic surviving from the centuries between the Homeric epics and Virgil's *Aeneid*. One of the seminal works from the Hellenistic period, the *Argonautica* tells the famous myth of Jason's quest for the Golden Fleece. In this course, we read Book 3, which depicts the hero's ill-fated meeting with the Colchian princess Medea and his trial with the Colchian king's fire-breathing oxen. Alongside the *Argonautica*, we read excerpts from Homer's *Iliad* and *Odyssey*, Euripides' *Medea*, and Pindar's *Pythian 4*, all of which were important influences for Apollonius, a learned Alexandrian scholar. With particular attention to language and characterization, we look at how Apollonius' *Argonautica* draws on these earlier works and interacts with them in ways that reflect the scholarly atmosphere and poetic aesthetic of the Hellenistic period. By exploring Apollonius' creative interaction with his predecessors and his emotional deep dive into the psychology of Medea, we trace some of the continuities in epic storytelling from the Homeric heritage to Apollonius' influence on subsequent writers as we ponder

the questions of what makes an epic great and what makes a story last. Prerequisite: L4 Greek or equivalent, or permission of the DUS or instructor. L5, HU

* **GREK 430b, Aristophanes** Emily Greenwood Milne

Intensive reading and study of Aristophanes' plays in their historical, social, and intellectual context. L5, HU

* **GREK 443a, 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 478a, Athenian Oratory: Law & Litigation** Jessica Lamont

This course expands and deepens students' grasp of ancient Greek grammar and syntax, while honing abilities to translate prose texts of the fifth and fourth centuries BCE. As a "bridge" course, this seminar also introduces students to Athenian law and the workings of the courts within a robust ancient democracy. The course is primarily focused on the work of three Attic speech-writers of the later fifth and fourth centuries BCE, Antiphon, Lysias, and Demosthenes; students also read a handful of contemporary Greek texts, inscribed on lead and meant to give litigants an edge over their opponents at trial (making use of the collections in the Beinecke). A goal of this course is to help transition students from translating ancient Greek accurately, into the realm of (1) asking critical and interpretive questions of primary texts bound by a common genre or theme, (2) considering strategies of translation, (3) analyzing the narrative styles of three Greek prose writers, and (4) thinking about speech-writing within its historical context. This course thus familiarizes students with the form, circumstances, and evolution of Attic oratory as a performative, rhetorical, and historical genre, while paying close attention to grammar and syntax in all reading and translation exercises. Prerequisite: Ancient Greek L1, L2. L4, HU

GREK 730b, Aristophanes' *Acharnians* and *Birds* Emily Greenwood Milne

Intensive reading and study of Aristophanes' plays in their historical, social, and intellectual context.

GREK 743a, 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 011a, 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. Preregistration required; see under First-Year Seminar Program. SO

* **ANTH 018a, 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. Preregistration required; see under First-Year Seminar Program. SC, SO

*** ANTH 021b / PLSC 075b, Memorialization of Mass Atrocities in the Digital Age**

David Simon

This seminar explores the means, methods, and meaning of digitization of memorialization of mass violence. Along the way, we address a series of questions, such as "How has digitization changed the way in which violent pasts are represented, shared, and remembered?"; "How do the means of memorialization influence what gets remembered?"; "What advantages#and what risks#does digital media pose for the project of memorialization?"; "How can digital technology be used#and perhaps misused#in the service of memorialization?"; "In what directions#and to what consequences#can we expect memorialization to move in the future, in light of technological change?" The course is premised on the notion that memorialization is a key project that allows individuals, communities, and societies to process episodes of mass violence in their own recent#or even distant#pasts. SO

*** ANTH 040b, The Evolution of Human Uniqueness** David Watts

Current ideas in anthropology about what facilitated the evolutionary success of *Homo sapiens* and what distinguishes humans from other primates. The fossil and archaeological records for human evolution and the evolution of social behavior; research on nonhuman primate behavior and cognitive abilities, with an emphasis on chimpanzees; insights and limitations of comparative primate research. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO

ANTH 110b, 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

ANTH 116a, Introduction to Biological Anthropology Jessica Thompson

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

* **ANTH 128a / CLCV 307a / RLST 128a, Emotion and Identity in Antiquity** Daniel Eastman

“You are what you feel.” But how much control do we have over how we feel? Does – or can – everyone experience the world through the same categories of feeling, or “emotions”? To what extent are people’s emotional options constrained or scripted by aspects of identity such as religion, gender, class, and language? This seminar explores the connections between emotions and identity in the context of the ancient Mediterranean world, with reference to modern theories of emotion along the way. Topics covered include (1) ancient theories of what emotions are and how they relate to the “self”; (2) norms concerning which emotions are “proper” and for whom (including humans, animals, and gods; women and men; and “pagans,” Jews, and Christians); and (3) practical methods used to cultivate certain emotions over others.

HU

ANTH 171a / ARCG 171a, Great Civilizations of the Ancient World Anne Underhill

A survey of selected prehistoric and historical cultures through examination of archaeological sites and materials. Emphasis on the methodological and theoretical approaches by which archaeologists recover, analyze, and interpret the material remains of the past. SO

ANTH 204a, 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 is a series of lectures on 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 217a, Hormones, Evolution, and Human Behavior Richard Bribescas

This course examines the evolution of human behavior through the lens of endocrinology and life history theory. Topics include the evolution of social behavior, pair bonding, parental investment, aggression, sex, feeding behavior, and risk tolerance. This course also addresses these topics with a mindful eye towards variation throughout the human life course from birth to death. Specific attention is made towards examining behavioral endocrinology within the context of human diversity in all its forms, social, biological, and ecological as well as in comparison with other species including non-human primates. ANTH 116, ANTH 242, or a similar course is recommended before enrolling in this course. SO

* **ANTH 230a / WGSS 230a, Evolutionary Biology of Women's Reproductive Lives** Claudia Valeggia

Evolutionary and biosocial perspectives on female reproductive lives. Physiological, ecological, and social aspects of women's development from puberty through menopause and aging, with special attention to reproductive processes such as pregnancy, birth, and lactation. Variation in female life histories in a variety of cultural and ecological settings. Examples from both traditional and modern societies. SC

ANTH 242b, 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

ANTH 244a, 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

*** ANTH 255b / ARCG 255b / LAST 255b, Inca Culture and Society** Richard Burger

The history and organization of the Inca empire and its impact on the nations and cultures it conquered. The role of archaeology in understanding the transformation of Andean lifeways; the interplay between ethnohistoric and archaeological approaches to the subject. SO

ANTH 264a / ARCG 264a / SPAN 404a, Aztec Archaeology and Ethnohistory

Oswaldo Chinchilla Mazariegos

An anthropological and ethnohistorical examination of the Aztec civilization that dominated much of Mexico from the fourteenth century until the Spanish Conquest of 1521. SO

ANTH 267a / ARCG 267a, Human Evolution Jessica Thompson

This course deals with scientific questions of human origins and evolution and what we think we know of our own ancestry over the past 6 million years. We begin with an overview of theories and techniques such as evolutionary theory, paleontology, archaeology, paleoenvironmental reconstruction, phylogenetic analysis, genetics, and functional morphology. We critically examine what key debates have taken place over the last century of exploration and discovery in human evolutionary research, learning how unconventional thinking and spectacular discoveries have shaped current knowledge of our origins. Students meet quirky historical characters, and the fossil relatives themselves to understand their morphology, life history patterns, locomotor repertoire, behavior, and dietary constraints. Students discover what a surprising amount of information scientists can discern from fragmentary fossils, and are brought up to date with the most current discoveries and debates in human

evolution. Knowledge of introductory biological anthropology or biology are helpful.

SO

ANTH 269b, Apes and Human Evolution David Watts

Humans belong to the Hominoidea, a family of primates that also include the apes (gibbons, orangutans, gorillas, chimpanzees, and bonobos). The evolutionary history that we share with living apes, combined with our inability to study the behavior of extinct hominins (members of the human lineage since it diverged from the last common ancestor with chimpanzees and bonobos) directly, makes comparative research on their anatomy, social behavior, ecology, and psychology highly relevant to many issues in the study of human evolution. This course provides an overview of ape evolution, ecology, and social behavior and uses this as background for addressing some of these issues. Examples include how research on apes contributes to reconstructions of the behavior and ecology of extinct hominins; what we can learn from chimpanzees about the importance of hunting and meat eating in human evolution; whether data on intergroup aggression in chimpanzees provides insights into human behavior, and why chimpanzee-bonobo contrasts are important; how studying communication informs us about communication in humans, and whether it tells us anything about language; whether chimpanzees have culture; and how research on ape cognition challenges or confirms claims for human uniqueness. SO

*** ANTH 301a / ARCG 301a, Foundations of Modern Archaeology** Richard Burger

Discussion of how method, theory, and social policy have influenced the development of archaeology as a set of methods, an academic discipline, and a political tool. Background in the basics of archaeology equivalent to one introductory course is assumed. SO

*** ANTH 308b / WGSS 407b, Feminist & Queer Ethnographies: Family, Community, Nation** Eda Pepi

This seminar centers the analytics and methods that feminist and queer ethnographic analyses have brought to the fore to revisit a cluster of topical issues, this year assembled around the theme: *Family, Community, Nation*. As a site in which personhood is distributed and contested, the “family” is one of the building blocks of social scientific analysis – along with “community” and “nation.” Seen as ideological lynchpins for the reproduction of the social order, processes of family-making – like marriage, divorce, childbirth, and intergenerational flows – have been codified differently across historical and cultural contexts. This course engages the feminist and queer ethnographies that revealed the political hierarchies that emerge from seemingly natural categories and distinctions of kinship. We trace the gendered, sexualized, class-making, and racialized concepts, processes, and implicit understandings of family-making that chart the public and private spheres of community and national terrains. Students grapple with the processes of naturalization and denaturalization through which the “political” is mobilized and dyads like kin/kith, blood/soil, human/nonhuman, citizen/noncitizen, us/them, are made to appear. We also engage with feminist and queer methodologies that conjure up speculative fabulations for, what Saidiya Hartman has called, “the radical hope for living otherwise.” We do so at a time when the global Covid-19 pandemic has demanded the resurgence of the state, tested community ties, transformed family arrangements, and isolated most of the world’s population within domestic domains. HU, SO RP

ANTH 316La / ARCG 316La, 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.

*** ANTH 322a / EVST 324a / SAST 306a, Environmental Justice in South Asia**

Kalyanakrishnan Sivaramakrishnan

Study of South Asia's nation building and economic development in the aftermath of war and decolonization in the 20th century. How it generated unprecedented stress on natural environments; increased social disparity; and exposure of the poor and minorities to environmental risks and loss of homes, livelihoods, and cultural resources. Discussion of the rise of environmental justice movements and policies in the region as the world comes to grips with living in the Anthropocene. SO

*** ANTH 326b / ARCG 326b, Ancient Civilizations of the Eurasian Steppes**

William Honeychurch

Examination of peoples of the steppe zone that stretches from Eastern Europe to Mongolia. Overview of what archaeologists know about Eurasian steppe societies, with emphasis on the Neolithic, Bronze and Iron, and medieval ages. Attention both to material culture and to historical sources. Topics range from the domestication of the horse to Genghis Khan's world empire, including the impact these events had on neighboring civilizations in Europe and Asia. SO

*** ANTH 335a / E&EB 342a, Primate Diversity and Evolution**

Eric Sargis

The diversity and evolutionary history of living and extinct primates. Focus on major controversies in primate systematics and evolution, including the origins and relationships of several groups. Consideration of both morphological and molecular studies. Morphological diversity and adaptations explored through museum specimens and fossil casts. Recommended preparation: ANTH 116 or BIOL 104. SC

*** ANTH 346b, Anthropological Approaches to Capitalism**

Douglas Rogers

An introduction to the anthropological study of capitalism. Focus on how markets and commodities are embedded in social, cultural, and political contexts. Discussion of the many ways people have embraced, reinterpreted, and resisted capitalism worldwide. Consideration of the implications of this diversity for theories of capitalism as a whole. Enrollment limited to sophomores. SO

*** ANTH 354b, Cuerpos Femeninos (Female Bodies): Biology, Evolution, and Society**

Claudia Valeggia

This course is not your regular lecture or seminar class. It is indeed a journey, an exploration of female bodies from an evolutionary and biosocial perspective. We focus on physiological, ecological, and social aspects of women's development from puberty, through reproductive processes such as menstrual cycles, pregnancy, birth, postpartum and breastfeeding, and menopause. We also explore variation in female life histories in a variety of western and non-western cultural and ecological settings. Examples are drawn primarily from traditional and modern human societies and our own life experiences. We encourage critical thinking at all times with the hope that discussions in this class become useful when making decisions about your lives as citizens, potential parents, health care providers, health care recipients, and policy makers. This course is

taught entirely in Spanish. Open to students who have placed into L5 courses or who have successfully completed an L4 course in Spanish. L5, SO

* **ANTH 366b / AMST 435b, Inequality in America** Kathryn Dudley

Sociocultural dimensions of social inequality in the contemporary United States. Ways in which the socioeconomic processes that produce inequality are inextricably embedded in worlds of cultural meaning; how those meanings are constructed and embodied in everyday practice. Perspectives from anthropology, sociology, economics, history, and popular media. SO

* **ANTH 367a, Technology and Culture** Lisa Messeri

This class examines how technology matters in our daily lives. How do technologies shape understandings of ourselves, the worlds we inhabit, and each other? How do the values and assumptions of engineers and innovators shape our behaviors? How do technologies change over time and between cultures. Students learn to think about technology and culture as co-constituted. We read and discuss texts from history and anthropology of science, as well as fictional explorations relevant to course topics.

* **ANTH 371a, Modern Indonesia** J Joseph Errington

Political and cultural dynamics in contemporary Indonesia explored from historical and anthropological perspectives. Major ethnic groups, key historical dynamics, political culture, and interaction between modernization and traditional lifeways. Issues of ethnicity, gender, religion, and economy in situations of rapid social change. SO

* **ANTH 374a / ARCG 374a / LAST 374a, Origins of Andean Civilization** Richard Burger

The diversity of early Andean complex societies and their transformations during the first two millennia B.C. Special attention to the Chavin civilization of the northern Peruvian highlands, including its art, technology, socioeconomic organization, territorial expansion, and cultural antecedents. Emphasis on recent research and on explanatory models that have been used to explain the emergence of complexity in pre-Hispanic Peru. SO RP

* **ANTH 376b / EVST 377b, Observing and Measuring Behavior** Eduardo Fernandez-Duque

Survey of theoretical issues and practical methods relevant to the study of animal and human behavior, primarily in the wild. Topics include research design, behavioral and ecological sampling protocols, basic methods for data analysis, including simple descriptive and analytical statistics, and widely-used technologies that facilitate the study of behavior, such as radiotelemetry. Working around a specific research question, students design their own behavioral study. Prerequisite: Course in evolutionary biology or in the study of animal behavior. SC, SO

ANTH 380a / LING 219a, The Evolution of Language and Culture Claire Bowern

Introduction to cultural and linguistic evolution. How human language arose; how diversity evolves; how innovations proceed through a community; who within a community drives change; how changes can be “undone” to reconstruct the past. Methods originally developed for studying evolutionary biology are applied to language and culture. WR, SO

- * **ANTH 381a / WGSS 378a, Sex and Global Politics** Graeme Reid
 Global perspectives on the sexual politics of gender identity, sexual orientation, and human rights. Examination of historical, cultural, and political aspects of sexual orientation and gender identity in the context of globalization. SO
- * **ANTH 385b / ARCG 385b, 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 386a / GLBL 393a, Humanitarian Interventions: Ethics, Politics, and Health**
 Catherine Panter-Brick
 Analysis of humanitarian interventions from a variety of social science disciplinary perspectives. Issues related to policy, legal protection, health care, morality, and governance in relation to the moral imperative to save lives in conditions of extreme adversity. Promotion of dialogue between social scientists and humanitarian practitioners. WR, SO
- * **ANTH 387b / ARCG 387b, East Asian Objects and Museums** Anne Underhill
 Exploration of East Asian art and anthropological collections at Yale's museums and at other major museums in North America and East Asia. Through study of the pioneers who created these collections and the formation history of the collections, students consider the meaning and importance of contemporary museum practice. A student-curated exhibition in conjunction with Yale University Art Gallery. Trips to regional museums and attendance at Yale sponsored conference on Korean Art and Photograph Collections. SO
- * **ANTH 388b, Politics of Culture in Southeast Asia** Erik Harms
 The promotion of national culture as part of political and economic agendas in Southeast Asia. Cultural and political diversity as a method for maintaining a country's cultural difference in a global world. SO
- * **ANTH 391b / ARCG 391b, Paleoclimate and Human Response** Roderick McIntosh
 The recursive interaction of climate change with human perception and manipulation of the landscape. Mechanisms and measures of climate change; three case studies of historical response to change at different scales. Prerequisite: an introductory course in archaeology. SO
- * **ANTH 394a, 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
- * **ANTH 397a / ARCG 397a, Archaeology of East Asia** Anne Underhill
 Introduction to the findings and practice of archaeology in China, Japan, Korea, and southeast Asia. Methods used by archaeologists to interpret social organization, economic organization, and ritual life. Attention to major transformations such as the initial peopling of an area, establishment of farming villages, the development of cities, interregional interactions, and the nature of political authority. SO

* **ANTH 409a / ER&M 394a / EVST 422a / F&ES 422a / GBL 394a, Climate and Society from Past to Present** Michael Dove

Discussion of the major currents of thought – both historic and contemporary – regarding climate, climate change, and society; focusing on the politics of knowledge and belief vs disbelief; and drawing on the social sciences and anthropology in particular. WR, SO

* **ANTH 413a, Language, Culture, and Ideology** J Joseph Errington

Review of influential anthropological theories of culture, with reference to theories of language that inspired or informed them. American and European structuralism; cognitivist and interpretivist approaches to cultural description; the work of Bakhtin, Bourdieu, and various critical theorists. SO RP

* **ANTH 414a / EAST 417a, Hubs, Mobilities, and World Cities** Helen Siu

Analysis of urban life in historical and contemporary societies. Topics include capitalist and postmodern transformations; class, gender, ethnicity, and migration; and global landscapes of power and citizenship. SO RP

* **ANTH 417a / ARCG 417a, 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 428b / PHIL 493b / RLST 428b, Neighbors and Others** Nancy Levene

This course is an interdisciplinary investigation of concepts and stories of family, community, borders, ethics, love, and antagonism. Otherwise put, it concerns the struggles of life with others – the logic, art, ethnography, and psychology of those struggles. The starting point is a complex of ideas at the center of religions, which are given to differentiating "us" from "them" while also identifying values such as the love of the neighbor that are to override all differences. But religion is only one avenue into the motif of the neighbor, a fraught term of both proximity and distance, a contested term and practice trailing in its wake lovers, enemies, kin, gods, and strangers. Who is my neighbor? What is this to ask and what does the question ask of us? Course material includes philosophy, anthropology, psychology, fiction, and film. HU

* **ANTH 438a, Culture, Power, Oil** Douglas Rogers

The production, circulation, and consumption of petroleum as they relate to globalization, empire, cultural performance, natural resource extraction, and the nature of the state. Case studies include the United States, Saudi Arabia, Nigeria, Venezuela, and the former Soviet Union. SO

* **ANTH 439b, Africa, Politics, Anthropology** Louisa Lombard

Historical-anthropological study of politics in Africa since the early nineteenth century. The creation and operation of African states; the negotiation of legitimacy, authority, and belonging by state agents and the people they govern; anthropological theories about the workings of African politics, including the involvement of both state and nonstate actors. SO

* ANTH 441a / MMES 399a / MMES 430a / WGSS 430a, **Gender and Citizenship in the Middle East** Eda Pepi

This seminar explores the gendered and ethnic-based social processes and forms of power that citizenship, statelessness, and migration crises fuel, and are fueled by, in the Middle East and North Africa. The history of gender and citizenship in the region is imbricated in ethnosexual and orientalist colonial legacies that articulate a racialized problematic of “modernity.” Part of these legacies involve obscuring the role that women, sexual minorities, and gender, more broadly, have played in framing citizenship and statehood in the Middle East in global, regional, and local imaginations not only as border policing and legal doctrine, but as signifier—and *reifier*—of culture, race, and ethnicity. By examining the gendered and sexual dimensions of war, conflict, and partition, and the formation of modern citizenship in the Middle East, the seminar presents ethnographic, historical, literary and visual scholarship that theorizes the role of kinship and citizenship in gendered and racialized narratives of the nation and political sovereignty. SO

* ANTH 448a, **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

* ANTH 451b / WGSS 431b, **Intersectionality and Women’s Health** Marcia Inhorn

The intersections of race, class, gender, and other axes of “difference” and their effects on women’s health, primarily in the contemporary United States. Recent feminist approaches to intersectionality and multiplicity of oppressions theory. Ways in which anthropologists studying women’s health issues have contributed to social and feminist theory at the intersections of race, class, and gender. SO

* ANTH 454b / ARCG 454b, **Statistics for Archaeological Analysis** William Honeychurch

An introduction to quantitative data collection, analysis, and argumentation for archaeologists. Emphasis on the exploration, visualization, and analysis of specifically archaeological data using simple statistical approaches. No prior knowledge of statistics required. QR

ANTH 464a / ARCG 464a / E&EB 464a, **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

* **ANTH 471a or b and ANTH 472a or b, Readings in Anthropology** Staff

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 473a / ARCG 473a / EVST 473a / NELC 473a, Climate Change, Societal Collapse, and Resilience** Harvey Weiss

The coincidence of societal collapses throughout history with decadal and century-scale abrupt climate change events. Challenges to anthropological and historical paradigms of cultural adaptation and resilience. Examination of archaeological and historical records and high-resolution sets of paleoclimate proxies. HU, SO

* **ANTH 491a or b, The Senior Essay** Staff

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.

Applied Mathematics (AMTH)

AMTH 222a or b / MATH 222a 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 244a or b / MATH 244a 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. Recommended preparation: MATH 115 or equivalent. QR

AMTH 262a / CPSC 262a / S&DS 262a, Computational Tools for Data Science Roy Lederman

Introduction to the core ideas and principles that arise in modern data analysis, bridging statistics and computer science and providing students the tools to grow and adapt as methods and techniques change. Topics include principal component analysis, independent component analysis, dictionary learning, neural networks and optimization, as well as scalable computing for large datasets. Assignments include implementation, data analysis and theory. Students require background in linear algebra, multivariable calculus, probability and programming. Prerequisites: after or concurrently with MATH 222, 225, or 231; after or concurrently with MATH 120, 230,

or ENAS 151; after or concurrently with CPSC 100, 112, or ENAS 130; after S&DS 100-108 or S&DS 230 or S&DS 241 or S&DS 242. Enrollment is limited; requires permission of the instructor. QR

*** AMTH 342a / EENG 432a, 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 364b / EENG 454b / S&DS 364b, Information Theory Andrew Barron

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 420b / MATH 421b, The Mathematics of Data Science Anna Gilbert

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 428a / E&EB 428a / EPS 428a / PHYS 428a, Science of Complex Systems Jun Korenaga

Introduction to the quantitative analysis of systems with many degrees of freedom. Fundamental components in the science of complex systems, including how to simulate complex systems, how to analyze model behaviors, and how to validate models using observations. Topics include cellular automata, bifurcation theory, deterministic chaos, self-organized criticality, renormalization, and inverse theory. Prerequisite: PHYS 301, MATH 247, or equivalent. QR, SC

AMTH 431a / S&DS 431a, Optimization and Computation Anna Gilbert

This course is designed for students in Statistics & Data Science who need to know about optimization and the essentials of numerical algorithm design and analysis. It is an introduction to more advanced courses in optimization. The overarching goal of the course is teach students how to design algorithms for Machine Learning and Data Analysis (in their own research). This course is not open to students who have taken S&DS 430. Prerequisites: Knowledge of linear algebra, multivariate calculus, and probability. Linear Algebra, by MATH 222, 223 or 230 or 231; Graph Theory, by MATH 244 or CPSC 365 or 366; and comfort with proof-based exposition and problem sets, such as is gained from MATH 230 and 231, or CPSC 366.

*** AMTH 480a, Directed Reading** John Wettlaufer

Individual study for qualified students who wish to investigate an area of applied mathematics 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.

*** AMTH 482a, 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 491a, 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 050a or b / ENAS 050a or b / PHYS 050a or b, 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. Preregistration required; see under First-Year Seminar Program. SC

*** APHY 100b / ENAS 100b / EPS 105b / EVST 100b / PHYS 100b, 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

APHY 110b / ENAS 110b, The Technological World Owen Miller

An exploration of modern technologies that play a role in everyday life, including the underlying science, current applications, and future prospects. Examples include solar cells, light-emitting diodes (LEDs), computer displays, the global positioning system, fiber-optic communication systems, and the application of technological advances to medicine. For students not committed to a major in science or engineering; no college-level science or mathematics required. Prerequisite: high school physics or chemistry. QR, SC

APHY 151a or b / ENAS 151a or b / PHYS 151a 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 194a or b / ENAS 194a 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 equivalent, and knowledge of matrix-based operations. QR RP

APHY 293a / PHYS 293a, 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 320a / EENG 320a, Introduction to 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 322b, Electromagnetic Waves and Devices Robert Schoelkopf

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 418b / EENG 402b, Advanced Electron Devices Staff

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 420a / PHYS 420a, Thermodynamics and Statistical Mechanics** Meng Cheng

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 439a / PHYS 439a, Basic Quantum Mechanics Sohrab Ismail-Beigi

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 448a / PHYS 448a, 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 449b / PHYS 449b, Solid State Physics II Vidvuds Ozolins

The second term of the sequence described under APHY 448. QR, SC

APHY 458a / PHYS 458a, 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 469a or b, Special Projects** Daniel Prober

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 470b, 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 471a and APHY 472b, Senior Special Projects** Daniel Prober

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 110a, Elementary Modern Standard Arabic I Sarab Al Ani

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 120b, Elementary Modern Standard Arabic II Staff

Continuation of ARBC 110. Prerequisite: ARBC 110 or requisite score on a placement test. L2 RP 1½ Course cr

*** ARBC 130a, 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 RP 1½ Course cr

ARBC 136a, Intermediate 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 120 or permission of instructor. May be taken concurrently with ARBC 130 or 150. L3 RP

ARBC 140b, Intermediate Modern Standard Arabic II Muhammad Aziz

Continuation of ARBC 130. Prerequisite: ARBC 130 or requisite score on a placement test. L4 RP 1½ Course cr

ARBC 146b, Intermediate Classical Arabic II Staff

Continuation of ARBC 136. Prerequisite: ARBC 136 or permission of instructor. May be taken concurrently with ARBC 140 or 151. L4 RP

*** ARBC 150a, 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 140 or requisite score on a placement test. L5 RP

*** ARBC 151b, Advanced Modern Standard Arabic II** Jonas Elbousty

Continuation of ARBC 150. Prerequisite: ARBC 150 or requisite score on a placement test. L5 RP

*** ARBC 171b / ARBC 527b / LITR 267b / MMES 177b / NELC 237b / NELC 598b, Hunger in Eden: Mohamed Choukri's Narratives** Jonas Elbousty

A survey of the work of Mohamed Choukri, one of the most prominent Moroccan, if not Arab, writers to have shaped the modern Arabic literary canon. His influence has been instrumental in forming a generation of writers and enthusiastic readers, who fervently cherish his narratives. Students dive deeply into Choukri's narratives, analyzing them with an eye toward their cultural and political importance. The class looks to Choukri's amazing life story to reveal the roots of his passion for writing and explores the culture of the time and places about which he writes. Through his narratives, students better understand the political environment within which they were composed and the importance of Choukri's work to today's reader regarding current debates over Arab identity. This class surveys the entirety of his work, contextualizing within the sphere of Arabic novelistic tradition. Prerequisite: ARBC 151, L4 or equivalent, or permission from the of instructor. L5

*** ARBC 178a / MMES 172a, Yemeni Literature & Culture** Muhammad Aziz

This seminar introduces students to a variety of Yemeni novels, short stories, poetry, history, movies, songs, and culture. We delve deeply into the major Yemeni literary styles, in their forms of poetry, prose, movies, and series. A general sense of the transitional period between past and present in the modern era. Students are expected

to read the material at home and prepare for class discussions. Students grasp some sense of Yemeni history as well as literature in general. Prerequisite: ARBC 151. L5

* **ARBC 450a / LING 327a / NELC 453a, 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 140 and permission of instructor.

Archaeological Studies (ARCG)

* **ARCG 031a / EVST 030a / NELC 026a, Origins of Civilization: Egypt and Mesopotamia** Harvey Weiss

The origins of the earliest civilizations in Mesopotamia and Egypt along the Nile and Tigris-Euphrates Rivers explored with archaeological, historical and environmental data for the origins of agriculture, the classes and hierarchies that marked earliest cities, states and empires, the innovative monumental architecture, writing, imperial expansion, and new national ideologies. How and why these civilizational processes occurred with the momentous societal collapses at periods of abrupt climate change. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU, SO

ARCG 110a / HSAR 110a, Introduction to the History of Art: Global Decorative Arts Edward Cooke

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

ARCG 171a / ANTH 171a, Great Civilizations of the Ancient World Anne Underhill

A survey of selected prehistoric and historical cultures through examination of archaeological sites and materials. Emphasis on the methodological and theoretical approaches by which archaeologists recover, analyze, and interpret the material remains of the past. SO

ARCG 222b / AFST 112b / NELC 112b / RLST 141b, Egyptian Religion through the Ages John Darnell

Diachronic approach to topics in Egyptian religion. Religious architecture, evidence for protodynastic cults, foreigners in Egyptian religious celebrations, music and vocal expression in Egyptian religion, Re and Osiris, the Amarna interlude and the Ramesside solar religion, and the goddess of the eye of the sun. Readings in translation. HU

* **ARCG 245a / NELC 243a, Archaeology of Ancient Egypt: An Introduction** Gregory Marouard

This seminar is an introductory class that examines in detail the archaeology of ancient Egypt following the chronological order of Egyptian history and covering almost 4000 years, from the late Neolithic period to the end of the Greco-Roman period. The aim is not only to give a comprehensive overview of major sites and discoveries but also to use as much as possible information from recent excavations, discuss problems and

priorities concerning this field, offer an introduction to new fieldwork methods and approaches used in Egypt as well as a short history of this discipline. HU

*** ARCG 246a / NELC 245a, Era of the Pyramids: Archaeology and Material Culture of the Old Kingdom, Egypt** Gregory Marouard

This seminar examines in detail the Old Kingdom period, covering about 800 years of this crucial phase of the Egyptian civilization, starting with the late phase of the Early Dynastic state formation period (ca. 2850 BCE) to the First Intermediate period (ca. 2050 BCE), encompassing the 3rd to the 6th Dynasties. All major archaeological sites of this period are investigated through the scope of material culture, art and architecture, using as much as possible information from recent excavations and discoveries in this specific field. This approach includes the study of the large mortuary complexes, from Saqqara to Dahschur, Giza Abu Rawash and Abusir, as well several settlement sites from the central state capital in the Memphite region, the lower and upper provinces to the Egyptian borders. Several aspects of the connections established by Egypt with its neighboring areas such as Nubia and the Levant and deserted areas at the periphery of the Nile Valley are included to illustrate the extensive exchange network and the complex economy and administrative system established in order to support the major construction projects engaged during this period. Material culture, artistic aspects and typologies (within an overview of reliefs and statuary), craft productions, everyday life activities and burial practices are addressed. This course constitutes the first step of a series of chronological survey courses in Egyptian Archaeology. HU

*** ARCG 255b / ANTH 255b / LAST 255b, Inca Culture and Society** Richard Burger

The history and organization of the Inca empire and its impact on the nations and cultures it conquered. The role of archaeology in understanding the transformation of Andean lifeways; the interplay between ethnohistoric and archaeological approaches to the subject. SO

ARCG 264a / ANTH 264a / SPAN 404a, Aztec Archaeology and Ethnohistory

Oswaldo Chinchilla Mazariegos

An anthropological and ethnohistorical examination of the Aztec civilization that dominated much of Mexico from the fourteenth century until the Spanish Conquest of 1521. SO

ARCG 267a / ANTH 267a, Human Evolution Jessica Thompson

This course deals with scientific questions of human origins and evolution and what we think we know of our own ancestry over the past 6 million years. We begin with an overview of theories and techniques such as evolutionary theory, paleontology, archaeology, paleoenvironmental reconstruction, phylogenetic analysis, genetics, and functional morphology. We critically examine what key debates have taken place over the last century of exploration and discovery in human evolutionary research, learning how unconventional thinking and spectacular discoveries have shaped current knowledge of our origins. Students meet quirky historical characters, and the fossil relatives themselves to understand their morphology, life history patterns, locomotor repertoire, behavior, and dietary constraints. Students discover what a surprising amount of information scientists can discern from fragmentary fossils, and are brought up to date with the most current discoveries and debates in human evolution. Knowledge of introductory biological anthropology or biology are helpful.

SO

* **ARCG 301a / ANTH 301a, Foundations of Modern Archaeology** Richard Burger
 Discussion of how method, theory, and social policy have influenced the development of archaeology as a set of methods, an academic discipline, and a political tool. Background in the basics of archaeology equivalent to one introductory course is assumed. SO

ARCG 316La / ANTH 316La, 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.

* **ARCG 326b / ANTH 326b, Ancient Civilizations of the Eurasian Steppes** William Honeychurch

Examination of peoples of the steppe zone that stretches from Eastern Europe to Mongolia. Overview of what archaeologists know about Eurasian steppe societies, with emphasis on the Neolithic, Bronze and Iron, and medieval ages. Attention both to material culture and to historical sources. Topics range from the domestication of the horse to Genghis Khan's world empire, including the impact these events had on neighboring civilizations in Europe and Asia. SO

* **ARCG 374a / ANTH 374a / LAST 374a, Origins of Andean Civilization** Richard Burger

The diversity of early Andean complex societies and their transformations during the first two millennia B.C. Special attention to the Chavin civilization of the northern Peruvian highlands, including its art, technology, socioeconomic organization, territorial expansion, and cultural antecedents. Emphasis on recent research and on explanatory models that have been used to explain the emergence of complexity in pre-Hispanic Peru. SO RP

* **ARCG 385b / ANTH 385b, 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 387b / ANTH 387b, East Asian Objects and Museums** Anne Underhill

Exploration of East Asian art and anthropological collections at Yale's museums and at other major museums in North America and East Asia. Through study of the pioneers who created these collections and the formation history of the collections, students consider the meaning and importance of contemporary museum practice. A student-curated exhibition in conjunction with Yale University Art Gallery. Trips to regional museums and attendance at Yale sponsored conference on Korean Art and Photograph Collections. SO

* **ARCG 391b / ANTH 391b, Paleoclimate and Human Response** Roderick McIntosh

The recursive interaction of climate change with human perception and manipulation of the landscape. Mechanisms and measures of climate change; three case studies of historical response to change at different scales. Prerequisite: an introductory course in archaeology. SO

* **ARCG 397a / ANTH 397a, Archaeology of East Asia** Anne Underhill

Introduction to the findings and practice of archaeology in China, Japan, Korea, and southeast Asia. Methods used by archaeologists to interpret social organization, economic organization, and ritual life. Attention to major transformations such as the initial peopling of an area, establishment of farming villages, the development of cities, interregional interactions, and the nature of political authority. SO

* **ARCG 417a / ANTH 417a, 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 454b / ANTH 454b, Statistics for Archaeological Analysis** William Honeychurch

An introduction to quantitative data collection, analysis, and argumentation for archaeologists. Emphasis on the exploration, visualization, and analysis of specifically archaeological data using simple statistical approaches. No prior knowledge of statistics required. QR

ARCG 464a / ANTH 464a / E&EB 464a, 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

* **ARCG 473a / ANTH 473a / EVST 473a / NELC 473a, Climate Change, Societal Collapse, and Resilience** Harvey Weiss

The coincidence of societal collapses throughout history with decadal and century-scale abrupt climate change events. Challenges to anthropological and historical paradigms of cultural adaptation and resilience. Examination of archaeological and historical records and high-resolution sets of paleoclimate proxies. HU, SO

Architecture (ARCH)

* **ARCH 006a, Architectures of Urbanism: Thinking, Seeing, Writing the Just City** Michael Schlabs

What is architecture, and how is it conceived, relative to notions of the urban – to the broader, deeper, messier web of ideas, forms, and fantasies constituting “the city?” Can architecture play a role in defining the city, as such, or does the city’s political and social construction place it outside the scope of specifically architectural concerns? Likewise, what role can the city play in establishing, interrogating, and extrapolating the limits of architecture, whether as a practice, a discourse, or a physical manifestation of human endeavor in the material environment? This course addresses these and other, related questions, seeking to position art and architecture in their broader urban, social, cultural, political, intellectual, and aesthetic contexts. It explores issues of social justice as they relate to the material spaces of the modern city, and the manner in which those spaces are identified, codified, and made operative in service of aesthetic, social, and

political experience. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. Prerequisite: general knowledge of 20th-century history. HU

ARCH 150a, Introduction to Architecture Alexander Purves

Lectures and readings in the language of architecture. Architectural vocabulary, elements, functions, and ideals. Notebooks and projects required. Not open to freshmen. Required for all Architecture majors. HU

*** ARCH 154b, 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. Open to first and second year students.

ARCH 160a / URBN 160a, Introduction to Urban Studies Elihu Rubin

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

*** ARCH 161a, Introduction to Structures** Erleen Hatfield

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 162b, Materials in Architecture** Timothy Newton

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.

ARCH 200b / URBN 200b, 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 250a, Methods and Form in Architecture I** Katherine Davies

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 251b, Methods and Form in Architecture II** Michael Schlabs

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 260a / HSAR 326a, History of Architecture to 1750 Kyle Dugdale

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

ARCH 271b / HSAR 266 / MMES 126 / SAST 266, Introduction to Islamic**Architecture** Kishwar Rizvi

Introduction to the architecture of the Islamic world from the seventh century to the present, encompassing regions of Asia, North Africa, and Europe. A variety of sources and media, from architecture to urbanism and from travelogues to paintings, are used in an attempt to understand the diversity and richness of Islamic architecture. Besides traditional media, the class will make use of virtual tours of architectural monuments as well as artifacts at the Yale University Art Gallery, accessed virtually. HU

ARCH 272a / HSAR 150a / RLST 262a, Introduction to the History of Art: Art and**Architecture of the Sacred** Jacqueline Jung

A wide-ranging, cross-temporal exploration of religious images, objects, and architecture in diverse cultures, from ancient Mesopotamia to modern Manhattan. Buddhist, Christian, Hindu, Jewish, Muslim, and various polytheistic traditions are represented. Thematic threads include the human body; transformations of nature; death, memory, and afterlife; sacred kingship and other forms of political engagement; practices of concealment and revelation; images as embodiments of the divine; the framing and staging of ritual through architecture. HU

ARCH 280b / AMST 197b / HSAR 219b / URBN 280b, American Architecture and**Urbanism** Elihu Rubin

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

* **ARCH 314b / URBN 314b, 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 places them within their historical and theoretical context. HU RP

* **ARCH 316a / URBN 416a, 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 325b / URBN 417b, Fugitive Practice: Introducing, Recentering, and Exploring Black and Indigenous Design Methods** Jerome Haferd and Curry Hackett

This seminar introduces and explores Black, indigenous, and other historically marginalized modes of cultural production – collectively referred to here as “fugitive practices.” The course confronts the erasure (and re-centering) of these modes by rethinking the episteme of architecture – questioning history, planning, and urbanism – but also of the body, the design of objects, and making. Modes of sociocultural and aesthetic production explored in the course may include: improvisation in jazz, hip-hop and social dance; textiles of the Modern African Diaspora and indigenous peoples; informal economies; ingenuity in vernacular architecture; and others. The course is structured around seven two-week “modules,” each containing a seminar discussion, a design exercise, and a short written accompaniment. It is conducted in collaboration with a parallel seminar being offered by faculty at Howard University. HU RP

* **ARCH 327a / URBN 327a, 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 341b / GLBL 253b / LAST 318b / URBN 341b, Globalization Space Keller Easterling

Infrastructure space as a primary medium of change in global polity. Networks of trade, energy, communication, transportation, spatial products, finance, management, and labor, as well as new strains of political opportunity that reside within their spatial disposition. Case studies include free zones and automated ports around the world, satellite urbanism in South Asia, high-speed rail in Japan and the Middle East, agripoles in southern Spain, fiber optic submarine cable in East Africa, spatial products of tourism in North Korea, and management platforms of the International Organization for Standardization. HU

ARCH 345a / URBN 345a, Civic Art: Introduction to Urban Design Alan Plattus
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

* **ARCH 353a / URBN 353a, Urban Lab: Urban Field Geography** Elihu Rubin
A methods seminar in urban field geography. Traveling on foot, students engage in on-site study of architecture, urban planning and design, cultural landscapes, and spatial patterns in the city. Learn how to "read" the urban landscape, the intersection of forces that have produced the built environment over time. HU 1½ Course cr

* **ARCH 354b / URBN 414b, New York as Incubator of 20th-Century Urbanism: Four Urban Thinkers and the City They Envisioned** Joan Ockman
This seminar is conceived as an argument among four polemical urban thinkers whose respective visions of the city were shaped by their response to the twentieth-century evolution of New York City: Lewis Mumford (1895–1990), Robert Moses (1888–1981), Jane Jacobs (1916–2006), and Rem Koolhaas (1944–). Among the issues that variously preoccupied them (and at times brought them into direct conflict) were housing and infrastructure, social diversity and environmental sustainability, civic representation and urban imagination. New York has been called the capital of the twentieth century. What lessons – what “usable past,” to borrow a concept from Mumford – does New York’s history offer us? And what kind of city is New York becoming in the twenty-first century? The aim of the seminar is twofold: to reconsider the legacy of this quartet of visionary intellectuals; and to trace modern New York’s urban and architectural development. HU

* **ARCH 360b / URBN 360b, Urban Lab: An Urban World** Staff
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 362a / URBN 362a, Urban Lab: City Making** Anthony Acciavatti
How architects represent, analyze, construct, and speculate on critical urban conditions as distinct approaches to city making. Investigation of a case study analyzing urban morphologies and the spatial systems of a city through diverse means of representation that address historical, social, political, and environmental issues. Through maps, diagrams, collages and text, students learn to understand spatial problems and project urban interventions. Prerequisites: For non-majors: permission of the instructor is required. For ARCH majors: ARCH 150, 200, and 280. 1½ Course cr

* **ARCH 450a, Senior Studio** Staff
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 471b, 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 472a, Individual Tutorial Lab** Michael Schlabs
RP ½ Course cr

* **ARCH 472La, Individual Tutorial Laboratory** Michael Schlabs
An independent tutorial focusing on methods and techniques of representation in architecture, including the synthesis of studio work using a variety of visual media. Concurrently with ARCH 471 or after a spring term abroad. RP ½ Course cr

* **ARCH 490a / URBN 490a, Senior Research Colloquium** Marta Caldeira
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 491b / URBN 491b, Senior Project** Marta Caldeira
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.

* **ARCH 494b, Senior Project Design Studio** Gavin Hogben
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

Armenian (ARMN)

Art (ART)

*** ART 004b, Words and Pictures** Staff

Introduction to visual narration, the combination of words and pictures to tell a story. Narrative point of view, counternarrative and counterculture, visual satire, personal history, depictions of space and time, and strategies and politics of representation. Sources include illuminated manuscripts, biblical paintings, picture-stories, comic strips, and graphic novels. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU RP

*** ART 006a, Art of the Printed Word** Staff

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. Preregistration required; see under First-Year Seminar Program. HU

*** ART 007b, 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. Preregistration required; see under First-Year Seminar Program.

*** ART 010a, Interdisciplinary Exploration For Making Fictional Worlds, Flying Machines, and Shaking Things Up** Staff

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. Preregistration required; see under First-Year Seminar Program. HU

*** ART 014b, 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. Preregistration required; see under First-Year Seminar Program. HU

*** ART 110b, 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. Course fee charged per term. Enrollment limited to 12. Recommended to be taken before ART 120-125. HU RP

*** ART 111a 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). Course fee charged per term. No prior drawing experience necessary. Open to all undergraduates. Required for Art majors. HU RP

*** ART 114a 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. Course fee charged per term. Open to all undergraduates. Required for Art majors. HU

*** ART 116a, Color Practice** Anoka Faruqee

Study of the interactions of color, ranging from fundamental problem solving to individually initiated expression. The collage process is used for most class assignments. Course fee charged per term. HU RP

*** ART 123a, How Things Meet** Elizabeth Tubergen and Desmond Lewis

This introductory studio course uses the joint or juncture as a literal and metaphorical point of departure for exploring wood and metal fabrication techniques and themes in contemporary art. Through fabrication-based assignments, shop time, discussions, readings, critiques, and field trips, students develop a modular skillset for making parallel to investigating the narrative nature of material, sustainability, and social issues as a foundation for a holistic art practice. RP

*** ART 130a 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. Course fee charged per term. Recommended for non-majors and art majors.

HU RP

*** ART 132a 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. Course fee charged per term. HU RP

*** ART 136a 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. Course fee charged per term. HU RP

*** ART 138a 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 a 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. Course fee charged per term. HU RP

*** ART 142a or b / FILM 162a or b, Introductory Documentary Filmmaking** A.L.

Steiner

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." Course fee charged per term. RP

*** ART 145b, 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. Course fee charged per term. RP

*** ART 184a, 3D Modeling for Creative Practice** Justin Berry

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. Course fee charged per term. RP

ART 185a, 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. Course fee charged per term. RP

*** ART 225a, 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 Beineke Rare Manuscripts Library, YUAG's prints & drawings study room, and the Odds & Ends Art Book Fair provide case studies and key examples for consideration. Course fee charged per term. Prerequisite: ART 111

*** ART 239a, Photographic Storytelling** Danna Singer

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 that demonstrate their unique artistic voice. 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 canon of photographic history as well as issues and topics in contemporary photography. Course fee charged per term.

*** ART 241a / FILM 161a, Introductory Film Writing and Directing** Jonathan Andrews

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. Course fee charged per term. RP

*** ART 245a, 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. Course fee charged per term. Enrollment limited.

*** ART 264a or b, 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. Course fee charged per term. Prerequisite: ART 132. RP

*** ART 265b, Typography: Expression, Structure, and Sequence** Henk Van Assen

Continued studies in typography, incorporating more advanced and complex problems. Exploration of grid structures, sequentiality, and typographic translation, particularly in the design of contemporary books, and screen-based kinetic typography. Relevant issues of design history and theory discussed in conjunction with studio assignments. Course fee charged per term. Prerequisite: ART 264. RP

*** ART 266b, History of Graphic Design** Douglass Scott

This course studies how graphic design responded to (and affected) international, social, political, and technological developments from its inception in ancient Sumeria, Egypt, and China. Emphasis is on examples of identity, persuasive messages, exhibit and environmental, information and data visualization, typography and publication, and design theories from 1450 to 2010 and the relationship of that work to other visual arts and design disciplines. In addition to lectures, assignments include two studio projects in which design is integrated with research and writing. Course fee charged per term. HU

*** ART 285b, 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. Course fee charged per term. Prerequisites: ART 111, 114, or 145, and familiarity with Macintosh-based platforms.

*** ART 294b, Technology and the Promise of Transformation** Justin Berry

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. Course fee charged per term.

*** ART 301a, Critical Theory in and Out of the Studio** Corey McCorkle

Key concepts in modern critical theory as they aid in the analysis of creative work in the studio. Psychoanalysis, Marxism, feminism, structuralism, and poststructuralism examined in relation to modern and contemporary movements in the visual arts, including cubism, surrealism, Arte Povera, pop, minimalism, conceptual art,

performance art, the Pictures group, and the current relational aesthetics movement. Course fee charged per term. HU RP

*** ART 331b, Intermediate Painting** Staff

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. Course fee charged per term. Prerequisite: ART 130, 230, 231, or permission of instructor. RP

ART 332a, Painting Time Sophy Naess

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. Course fee charged per term. Prerequisite: ART 130, 230, or 231, or with permission of instructor. HU RP

*** ART 337b, Picturing Us: Representation in Digital Photography** Staff

Photographic investigation of the politics of visibility and intersectionality, the social processes in which identities are formed and revised. Exploration of the constructions of race, gender, sexual orientation, nationality, citizenship, ethnicity, religion, and class. Students study problems through photography, including concepts of identity and the construction of identities; how some identities appear invisible, visible, or super-visible; and which identities speak authentically and also universally. Course fee charged per term. ART 136, ART 138, or equivalent. HU RP

*** ART 338a, Contemporary Problems in Color with Digital Photography** Theodore Partin

How do you make a contemporary portrait? What is an effective portrait? What makes a portrait today? Can one be made through observation? Is consent required? This class confronts these questions, among others, while addressing the often uneasy relationship between photographer and sitter. Using digital capture with an emphasis on color photography students produce original work in portraiture by committing to a regular and rigorous photographic practice. Range of tools addressed include working with RAW files, masks, compositing and grayscale, and medium and large-scale color inkjet printing. Students produce original work for critique, with special attention to ways in which their technical decisions can clarify their artistic intentions in representing a person. Course fee charged per term. Prerequisite: ART 138 or permission of the instructor. RP

ART 341b / FILM 355b, 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. Course fee charged per term. Enrollment limited to 8. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 241. RP

ART 342b / FILM 356b, Intermediate Documentary Filmmaking Michel Auder

Students explore the storytelling potential of the film medium by making documentary art. 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 using examples of students' work.

Exercises in storytelling principles. Course fee charged per term. Limited enrollment. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 141 or 142, and FILM 150. HU RP

ART 356b, Printmaking I Staff

An introduction to intaglio (dry point and etching), relief (woodcut), and screen printing (stencil), as well as to the digital equivalents of each technique, including photo screen printing, laser etching, and CNC milling. How the analog and digital techniques inform the outcome of the printed image, and ways in which they can be combined to create more complex narratives. Course fee charged per term. Prerequisite: ART 114 or equivalent. RP

* **ART 360b, Hidden Truth** Desmond Lewis

The forest is a place where one can experience nature by what is revealed in its treetops, animal life, and undergrowth. Creating a mold for metal casting requires hiding something away that is then, almost magically, re-revealed through the forces of applied heat. Both the forest and casting are socially powerful, surprising, and revelatory in their own ways.

* **ART 368a, Graphic Design Methodologies** Pamela Hovland

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. Course fee charged per term. Prerequisites: ART 132 and 264, or permission of instructor. RP

* **ART 369b, Interactive Design and the Internet: Software for People** Rosa McElheny

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. Course fee charged per term. No prior programming experience required. Prerequisite: ART 132 or permission of instructor. RP

ART 370a, Motion Design: Communicating with Time, Motion and Sound

Christopher Pullman

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. Course fee charged per term. Prerequisite: ART 265; ART 368 recommended. RP

* **ART 385b / FILM 348b / THST 400b, Performance and the Moving Image** Emily Coates and Joan MacIntosh

The boundaries between live and mediated performance explored through the creation of an original work that draws on methods in experimental theater, dance, and video art. Questions concerning live versus mediated bodies, the multiplication of time, space, and perspective through technology, and the development of moving images. The final production includes both a live performance and an art video. Application deadline January 5, 2018. Contact the instructors for more information. Open to students of all levels and majors. WR, HU

* **ART 389a / THST 395a, Postmodern Dance** Emily Coates

A studio-based exploration of the epochal shift in choreographic aesthetics known as postmodern dance. In the early 1960s, a cohort of young artists redefined what dance could be and do. Influenced by the composer John Cage, these artists invented new movement vocabularies and compositional forms. Through re-staging seminal dances from the 1960s and 1970s, we consider the social and political contexts in which postmodern dance emerged; its links to minimalism, sculpture, and experimental music; and its ongoing influence on twenty-first century global contemporary dance. The course includes a field trip to New York City to attend the reconstruction of Yvonne Rainer's dance "Parts of Some Sextets" (1965), which premieres in November in the Performa 19 Biennial. This class is open to students of all physical abilities and backgrounds; special accommodations will be crafted in the event of specific disabilities. HU

* **ART 395a 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. Course fee charged per term. Prerequisite: at least four courses in Art. HU RP

* **ART 401b, Photography Project Seminar** Lisa Kereszi

A further exploration of the practice of photography through a sustained, singular project executed in a consistent manner over the course of the semester, either by analog or digital means. Student work is discussed in regular critiques, the artist statement is discussed, and lectures are framed around the aesthetic concerns that the students' work provokes. Students are exposed to contemporary issues through visits to Yale's collections and in lectures by guest artists, and are asked to consider their own work within a larger context. Students must work with the technical skills they have already gained in courses that are the pre-reqs, as this is not a skills-based class. Pre req: Art 136 or 138 *and* preferably, 237, 338 or 379, or permission of the instructor. Required of art majors concentrating in photography. Course fee charged per term. Prerequisites: ART 136 for those working in analog and, for those working digitally, ART 138. Required for Art majors concentrating in photography. RP

ART 433b, Painting Studio: Space and Abstraction Molly Zuckerman-Hartung

A course for intermediate and advanced painting students, exploring historical and contemporary issues in abstract painting including geometric, optical, material, and gestural abstraction. Studio work is complemented by in-depth study of flatness, depth, color, authorship and expression. After guided assignments, ultimate emphasis will be on self-directed projects. May be taken more than once. Course fee charged per term.

Prerequisites: ART 230 and one course from ART 331, 332, or 342, or with permission of instructor. HU RP

*** ART 442a and ART 443b / FILM 483a and FILM 484b, 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. Course fee charged per term. Enrollment limited to 8. Priority to majors in Art and in Film & Media Studies. Prerequisite: ART 341.

*** ART 457b, Interdisciplinary Printmaking** Alexander Valentine

An in-depth examination of planographic techniques, including screen printing, lithography, and digital pigment printing. Relationships to more dimensional forms of printing such as collography, embossment, vacuum bag molding, and 3D printing. Creation of editions as well as unique objects, focusing on both individual techniques and creating hybrid forms. Course fee charged per term. Recommended for Art majors to be taken concurrently with ART 324 or 433. Prerequisite: at least one term of printmaking. RP

ART 468a, Advanced Graphic Design: Ad Hoc Series and Systems Julian Bittiner

A probe into questions such as how an artist can be present as an idiosyncratic individual in his or her work, and how that work can still communicate on its own to a broad audience. Concentration on making graffiti, i.e., the design of a set of outdoor marks and tours for New Haven. A technological component is included, both in the metaphor of designing outdoor interaction as a way to learn about screen-based interaction and in the final project to design an interface for a handheld computer. Course fee charged per term. Prerequisites: ART 264 or 265, and 367 or 368, or permission of instructor. RP

*** ART 469b, Advanced Graphic Design: Interpretation, Translation** Henk Van Assen

A probe into questions such as how an artist can be present as an idiosyncratic individual in his or her work, and how that work can still communicate on its own to a broad audience. Concentration on making graffiti, i.e., the design of a set of outdoor marks and tours for New Haven. A technological component is included, both in the metaphor of designing outdoor interaction as a way to learn about screen-based interaction and in the final project to design an interface for a handheld computer. Course fee charged per term. Prerequisites: ART 264 or 265, and 367 or 368, or permission of instructor. RP

*** ART 471a and ART 472b, Independent Projects** Lisa Kereszi

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. Course fee charged per term.

*** ART 495a, Senior Project I** Lisa Kereszi

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 496b, Senior Project II** Lisa Kereszi

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 030b, Search for Extraterrestrial Life** Staff

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. Preregistration required; see under First-Year Seminar Program. WR, SC

*** ASTR 040a / PHYS 040a, 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. Preregistration required; see under First-Year Seminar Program. SC

*** ASTR 080a, Current Research in Astrophysics** Charles Bailyn

This first-year seminar explores what 21st century astrophysicists study, and how they study it. We focus on the Astro2020 report recently released by the National Academy of Sciences, which lays out research opportunities for the coming decade. Along the way, we explore research currently being conducted here at Yale; the relationship between observational, theoretical, computational, and instrumental modes of research; the dynamics of collaborative research, from small groups to large international collaborations; success strategies and obstacles along the career path of scientists from undergraduates through senior investigators; presentation and dissemination of scientific results; the sources, politics and finances of grant funding; diversity and inclusion in the astronomical community. Some acquaintance and facility with high-school physics is recommended. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. SC RP

ASTR 105b, The Earth in its Cosmic Context Gregory Laughlin

Study of the formation, evolution, and history of Earth, its solar system, and its role in a larger cosmic context. Consideration of thousands of other recently discovered planetary systems; the role of life in shaping the Earth and its environment; and the consequences of human activity from a systems perspective. SC

ASTR 110a, 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 120b, Galaxies and the Universe Staff

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 155a, 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 170a, 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 180b, Introduction to Relativity and Black Holes Staff

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 210a, Stars and Their Evolution Robert Zinn

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

ASTR 255a / PHYS 295a, Research Methods in Astrophysics Hector Arce

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 310b, 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 320a, 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 330a, Scientific Computing in Astrophysics Marla Geha

Scientific computer programming in Astrophysics with a focus on the Python Programming language. Algorithms and workflows for reducing and analyzing Astrophysical datasets, both observational and computational. Emphasis is placed on best coding practices, including readability, version control, documentation, and computational efficiency. Weekly lectures, in-depth tutorial/workshops, and invited outside expert guest speakers. Students complete a programming project based on real astrophysical datasets. Prerequisite: ASTR 255 or permission of instructor. Some basic programming experience in Python is strongly recommended.

ASTR 355b, 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, or permission of instructor. Previous experience with computer programming recommended. QR, SC RP

*** ASTR 375a, Exoplanets** Gregory Laughlin

Planet formation, exoplanet detection techniques, and the modeling of observations of exoplanet atmospheres. Solar system architecture compared with other planetary systems. From an Earth-centric perspective, habitability factors of rocky planets and the implications for life elsewhere. Prerequisites: MATH 120 and PHYS 201 or equivalents, and one astronomy course numbered above 200. QR, SC

ASTR 380b, 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 RP

ASTR 385b, Introduction to Radio Astronomy Hector Arce

Introduction to the theory and techniques of radio astronomy, including radio emission mechanisms, propagation effects, antenna theory, interferometry, and spectroscopy. Discussion of specific sources such as Jupiter, radio stars, molecular clouds, radio galaxies, ETI, and the microwave background. Includes observational exercises with a small radio telescope. Prerequisites: MATH 120 and PHYS 201 or equivalents. QR, SC

ASTR 420a, 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 RP

ASTR 430a, Galaxies Jeffrey Kenney

A survey of the contents, structure, kinematics, dynamics, and evolution of galaxies; galaxy interactions and the environments of galaxies; properties of active galactic nuclei. Prerequisites: PHYS 201 and MATH 120, and one astronomy course numbered above 200. Taught in alternate years. QR, SC RP

Biology (BIOL)

BIOL 101a or b, Biochemistry and Biophysics Amaleah Hartman and 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. SC ½ Course cr

BIOL 102a or b, Principles of Cell Biology Amaleah Hartman and 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. SC ½ Course cr

BIOL 103a or b, Genetics and Development Thomas Loreng and 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. SC ½ Course cr

BIOL 104a 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. 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 ½ Course cr

Biomedical Engineering (BENG)

BENG 230a / MB&B 330a / MCDB 330a / NSCI 324a, 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

BENG 249b, Introduction to Biomedical Computation Michael Mak

Computational and mathematical tools used in biomedical engineering for the simulation of biological systems and the analysis of biomedical data. Basics of computational programming in MATLAB; applications to modeling, design, and statistical and data analysis. Prerequisite: MATH 120 or ENAS 151. QR

* **BENG 280a, Sophomore Seminar in Biomedical Engineering** Rong Fan

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 350a / MCDB 310a, Physiological Systems** Stuart Campbell and W. Mark Saltzman

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

BENG 351a / CENG 351a, 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

BENG 352b, Biomedical Signals and Images James Duncan and Lawrence Staib

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 353b / PHYS 353b, 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, 181, MATH 115, and ENAS 194. QR

* **BENG 355La, Physiological Systems Laboratory** Nicha Dvornek, Dustin Scheinost, and Steven Tommasini

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 ½ Course cr

* **BENG 356Lb, Biomedical Engineering Laboratory** Nicha Dvornek, Daniel Coman, and Jiangbing Zhou

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 ½ Course cr

* **BENG 403b / ECON 463b, 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 404b / MENG 404b, Medical Device Design and Innovation Steven Tommasini and Daniel Wiznia

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.

* **BENG 405b / EVST 415b, Biotechnology and the Developing World** Anjelica Gonzalez

Study of technological advances that have global health applications. Ways in which biotechnology has enhanced quality of life in the developing world. The challenges of implementing relevant technologies in resource-limited environments, including technical, practical, social, and ethical aspects. Prerequisite: MCDB 120, or BIOL 101 and 102.

* **BENG 406b, 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 project-based course focuses on the interaction of medical imaging and 3D printing. Topics include the methods and design principles to take 3D medical images, and how to image analysis algorithms to create 3D models to guide diagnosis and interventional procedures or build patient-specific medical devices. Permission of the instructor. Strong programming background in at least one programming language. SC

* **BENG 410a, Physical and Chemical Basis of Bioimaging and Biosensing** Fahmeed

Hyder, Douglas Rothman, and Richard Carson

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 422a, Engineering and Biophysical Approaches to Cancer** Michael Mak

This course focuses on engineering and biophysical approaches to cancer. The course examines the current state of the art understanding of cancer as a complex disease and the advanced engineering and biophysical methods developed to study and treat this disease. All treatment methods are covered. Basic quantitative and computational backgrounds are required. Prerequisites: BENG 249 or equivalent, MATH 120 or equivalent. QR, SC

* **BENG 435b, 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 444a, 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 449b, Biomedical Data Analysis 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

BENG 458b, Multiscale Models of Biomechanical Systems Stuart Campbell

Current methods for simulating biomechanical function across biological scales, from molecules to organ systems of the human body. Theory and numerical methods; case studies exploring recent advances in multiscale biomechanical modeling. Includes computer laboratory sessions that introduce relevant software packages. Prerequisites: BENG 249, 351, and 353, or permission of instructor. QR

BENG 463a, 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 immunodiagnosics. Prerequisite: A basic understanding of biochemistry, biophysics, cell biology; calculus and differential equations. QR, SC

BENG 465b / MB&B 361b / MCDB 361b / NSCI 325b, Modeling Biological Systems II

Thierry Emonet, Joe Howard, and Damon Clark

Advanced topics related to dynamical processes in biological systems. Processes by which cells compute, count, tell time, oscillate, and generate spatial patterns. Time-dependent dynamics in regulatory, signal-transduction, and neuronal networks; fluctuations, growth, and form. Comparisons between models and experimental data. Dynamical models applied to neurons, neural systems, and cellular biophysical processes. Use of MATLAB to create models. Prerequisite: MCDB 330 or equivalent, or a 200-level biology course, or with permission of instructor. QR

BENG 467b, 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 468b, 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 469b, 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 471a and BENG 472b, Special Projects** James Duncan

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 473a and BENG 474b, Senior Project** James Duncan

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.

BENG 475a / CPSC 475a / EENG 475a, 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 476b / CPSC 476b, Advanced Computational Vision Steven Zucker

Advanced view of vision from a mathematical, computational, and neurophysiological perspective. Emphasis on differential geometry, machine learning, visual psychophysics, and advanced neurophysiology. Topics include perceptual organization, shading, color and texture analysis, and shape description and representation. After CPSC 475. QR, SC

*** BENG 480a, Seminar in Biomedical Engineering** Andre Levchenko

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 485b, Fundamentals of Neuroimaging** Fahmeed Hyder 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

Bosnian-Serbian-Croatian (SBCR)

SBCR 110a, 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 minjin.hashbat@yale.edu for more information. L1 RP 1½ Course cr

*** SBCR 120b, 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 minjin.hashbat@yale.edu for more information. L2 RP 1½ Course cr

SBCR 130a, 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 minjin.hashbat@yale.edu for more information. L3 RP 1½ Course cr

*** SBCR 140b, 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 minjin.hashbat@yale.edu for more information. L4 RP 1½ Course cr

British Studies (BRST)

Burmese (BURM)

BURM 110a, Elementary Burmese I Staff

This course aims to train students to achieve basic skills in Burmese. The students develop competency in reading and writing Burmese script and also learn basic spoken Burmese. This course is taught through distance learning from Cornell University using videoconferencing technology. Interested students may e-mail minjin.hashbat@yale.edu for information. L1 RP 1½ Course cr

BURM 120b, Elementary Burmese II Staff

This course aims to give the students a confident and enjoyable start in speaking Burmese, focusing on what they are most likely to need when visiting the country. It covers the basics of pronunciation and grammar. Prerequisite: BURM 110 or equivalent. This course is taught through distance learning from Cornell

University using videoconferencing technology. Interested students may e-mail minjin.hashbat@yale.edu for information. L2 RP 1½ Course cr

Chemical Engineering (CENG)

CENG S150Eb / CENG 150b, Engineering Improv: An Introduction to Engineering

Analysis Paul Van Tassel

Online Course. Mathematical modeling is not a scripted procedure. Models are constrained by physical principles, including conservation laws and experimental observations but this does not provide a closed description. There is a lot more art in mathematical modeling than is commonly acknowledged and improvisation plays a significant role. The artistic aspects are important and intellectually engaging because they often lead to a deeper understanding. This course provides a general introduction to engineering analysis and to chemical engineering principles. Material includes the derivation of governing equations from first principles and the analysis of these equations, including underlying assumptions, degrees of freedom, dimensional analysis, scaling arguments, and approximation techniques. The goal of this course is to obtain the necessary skills for improvising mathematical models for a broad range of problems that arise in engineering, science and everyday life. Students from all majors are encouraged to take this course. 1 Credit. Technology fee: \$85. Tuition: \$4,500.

Session A: June 7 - July 9. Prerequisite: MATH 112. QR, SC

CENG S300a / CENG 300a, Chemical Engineering Thermodynamics Peijun Guo

Online Course. This is a rigorous introductory course in thermodynamics. Material will include the first and second laws of thermodynamics, cyclic processes, chemical reaction and phase equilibria, and an introduction to statistical thermodynamics.

The goal of this course is for students to obtain the necessary qualitative knowledge and quantitative skills for solving engineering science problems in thermodynamics.

Prerequisite: Multivariable calculus. 1 Credit. Technology Fee: \$85. Tuition: \$4,500.

Session B: July 12 - August 13. QR, SC

*** CENG 120b / ENAS 120b / ENVE 120b, Introduction to Environmental Engineering**

Jordan Peccia

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 150b / CENG S150Eb, Engineering Improv: An Introduction to Engineering

Analysis Paul Van Tassel

Mathematical modeling is not a scripted procedure. Models are constrained by physical principles, including conservation laws and experimental observations but this does not provide a closed description. There is a lot more art in mathematical modeling than is commonly acknowledged and improvisation plays a significant role. The artistic aspects are important and intellectually engaging because they often lead to a deeper understanding. This course provides a general introduction to engineering analysis and to chemical engineering principles. Material includes the derivation of governing equations from first principles and the analysis of these equations, including underlying assumptions, degrees of freedom, dimensional analysis, scaling arguments,

and approximation techniques. The goal of this course is to obtain the necessary skills for improvising mathematical models for a broad range of problems that arise in engineering, science and everyday life. Students from all majors are encouraged to take this course. Prerequisite: MATH 112. QR, SC

CENG 300a / CENG S300a, Chemical Engineering Thermodynamics Peijun Guo
Analysis of equilibrium systems. Topics include energy conservation, entropy, heat engines, Legendre transforms, derived thermodynamic potentials and equilibrium criteria, multicomponent systems, chemical reaction and phase equilibria, systematic derivation of thermodynamic identities, criteria for thermodynamic stability, and introduction to statistical thermodynamics. Prerequisite: MATH 120 or ENAS 151 or permission of instructor. QR, SC RP

CENG 301b, 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 RP

CENG 314a / ENVE 314a, 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 315b / ENVE 315b, Transport Phenomena II Amir Haji-Akbari
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 351a / BENG 351a, 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

CENG 373a / ENVE 373a, 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 377a / ENVE 377a, Water Quality Control** Jaehong Kim

Study of the preparation of water for domestic and other uses and treatment of wastewater for recycling or discharge to the environment. Topics include processes for removal of organics and inorganics, regulation of dissolved oxygen, and techniques such as ion exchange, electro dialysis, reverse osmosis, activated carbon adsorption, and biological methods. Prerequisite: ENVE 120 or permission of instructor. SC RP

CENG 411a, 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 412Lb, 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 416b / ENVE 416b, 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 471a or b, Independent Research Michael Loewenberg

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 480a, Chemical Engineering Process Control Eric Altman

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 RP

*** CENG 490a or b, Senior Research Project** Michael Loewenberg

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 104a, Chemistry of Food and Cooking E. Chui-Ying Yan

Fundamental principles for understanding chemical structures and interactions as well as energy and speed of chemical processes. Application of these principles to food and cooking, including demonstrations. This course is designed for non-STEM majors.

Prerequisite: preference given to students who have not taken AP or college-level chemistry. SC

CHEM 134La 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 $\frac{1}{2}$ Course cr

CHEM 136La or b, General Chemistry Laboratory II Narasimhan Ganapathi

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 $\frac{1}{2}$ Course cr

* **CHEM 163a, Advanced University Chemistry I** Nilay Hazari and James Mayer

An in-depth examination of the principles of atomic, molecular, and solid state chemistry, including structures, periodicity, and chemical reactivity. Topics include the quantum mechanics of atoms and chemical bonding, and inorganic, organic, and solid state molecules and materials. For students with strong secondary school exposure to general chemistry. Attendance at a weekly discussion section required. Normally accompanied by CHEM 134L. Enrollment by placement only. QR, SC RP

* **CHEM 165a 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

* **CHEM 167b, Advanced University Chemistry II** Hailiang Wang

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 163, or with equivalent placement. Normally accompanied by CHEM 136L. Enrollment by placement only. QR, SC RP

* **CHEM 174a, Organic Chemistry for First Year Students I** Timothy Newhouse

An introductory course focused on current theories of structure and mechanism in organic chemistry, their development, and their basis in experimental observation. Open to freshmen 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

* **CHEM 175b, Organic Chemistry for First Year Students II** David Spiegel

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

CHEM 220a 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

CHEM 221b, The Organic Chemistry of Life Processes Scott Miller

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

CHEM 222La or b, Laboratory for Organic Chemistry I Christine DiMeglio and 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 ½ Course cr

CHEM 223Lb, 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 ½ Course cr

CHEM 226La, Intensive Advanced Chemistry Laboratory Christine DiMeglio

An intensive course in advanced chemistry laboratory technique intended to bring the student closer to independent research. Included are an independent laboratory project and presentation, introduction to library research, and training in the use of various analytical techniques. Offered subject to available laboratory space and sufficient enrollment. After CHEM 223L. Enrollment is limited; e-mail course instructor for enrollment procedure. WR, SC RP

* **CHEM 230a, Organic Chemistry of Biological Pathways** Jason Crawford

Chemical principles that underpin living systems explored through organic chemistry. Examples drawn from chemistry, medicine, biotechnology, and the emergent field of chemical biology. Key conceptual frameworks such as structure, function, and mechanism and their relations to the chemistry of proteins, nucleic acids, selected drugs, and other topics in the life sciences. Mechanistic principles are used to examine enzymatic processes and the role of cofactors in the context of primary metabolism and natural products biosynthesis. After CHEM 220. Students must sign up for discussion sections using the Preference Selection tool. SC

CHEM 251Lb, Inorganic Chemistry Laboratory Jonathan Parr

Introductory laboratory course covering synthetic and physical characterization techniques in inorganic chemistry. Prerequisite: CHEM 119L or 222L; concurrently with or after CHEM 252. SC

CHEM 252b, Introductory Inorganic Chemistry Patrick Holland

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

CHEM 328a, Physical Chemistry with Applications in the Biological Sciences Ziad Ganim

Physical chemical principles and their application to the chemical and life sciences. Thermodynamics, chemical and biochemical kinetics, solution physical chemistry, electrochemistry, and membrane equilibria. CHEM 332 is preferred for Chemistry majors. Prerequisites: introductory physics, college-level general chemistry, and single-variable calculus, or permission of instructor; MATH 120 or ENAS 151 suggested. May not be taken after CHEM 332. QR, SC RP

CHEM 330La or b, Laboratory for Physical Chemistry I Paul Cooper

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

CHEM 331Lb, 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

CHEM 332a, Physical Chemistry with Applications in the Physical Sciences I Patrick Vaccaro

A comprehensive survey of modern physical and theoretical chemistry, including topics drawn from thermodynamics, chemical equilibrium, electrochemistry, and kinetics. Prerequisites: introductory physics, college-level general chemistry, and single-variable calculus, or permission of instructor; MATH 120 or ENAS 151 suggested. May not be taken after CHEM 328. QR, SC RP

*** CHEM 333b, 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. Recommended preparation: familiarity with differential equations. QR, SC RP

CHEM 355Lb, Chemical Biology and Bioanalytical Chemistry Laboratory Stacy Malaker

The goal of the Chemical Biology and Bioanalytical Chemistry Laboratory is to involve students in the challenge and excitement of instrumentation analysis, before such research opportunities might normally be available. Students work in teams and are assigned an unknown protein. They express, purify, and characterize their assigned protein via affinity chromatography, NMR, X-ray scattering, and mass spectrometry. This course is heavily reliant on the Chemical and Biophysical Instrumentation Center (CBIC), where students get hands-on experience with instruments. The semester culminates with students writing a manuscript in JACS format, followed by a conference-style poster session. Prerequisite: General chemistry lab, organic chemistry lab, one semester of biochemistry or chemical biology, or permission of instructor. SC

*** CHEM 400a, Current Chemistry Seminar** Narasimhan Ganapathi

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 402a, Fundamentals of Transition Metal Chemistry Patrick Holland

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 403a, 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 404a, Applications of Organometallic Chemistry Nilay Hazari

A half-term survey of the applications of organometallic chemistry that demonstrates to students the range of areas where organometallic reactions are important. It builds on the knowledge learned in CHEM 403, Fundamentals of Organometallic Chemistry. Prerequisites: Two terms of organic chemistry, one of CHEM 252, and CHEM 403 or equivalent experience. SC ½ Course cr

CHEM 405b, Inorganic Reaction Mechanisms James Mayer

This half-term course covers the fundamentals of kinetics and mechanisms used by coordination compounds and transition-metal catalysts, and features analysis of papers from the recent literature. Prerequisites: Two terms of organic chemistry, Chem 252 or equivalent, and CHEM 402 or equivalent. SC ½ Course cr

CHEM 406a, 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 408a, 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 416a, 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 417a, 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 419a, Foundations of Chemical Biology Stacy Malaker

Chemical biology is a rapidly developing field at the interface of chemical and biological sciences. This subject deals with how chemistry can be applied to manipulate and study biological problems using a combination of experimental techniques ranging from organic chemistry, analytical chemistry, biochemistry, molecular biology, biophysical chemistry and cell biology. The purpose of this course is to teach students the core skills that are used by scientists at the interface of chemistry and biology. The course transitions into Chemical Biology II, where students learn more about therapeutic applications of chemical biology. Prerequisites: Two terms of both general chemistry and organic chemistry. SC ½ Course cr

CHEM 424a, Applications of Chemical Biology to Therapy 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 bifunctional molecules. Modern approaches for target discovery and validation are also discussed. Prerequisites: CHEM 419, two semesters of undergraduate organic chemistry, or permission of instructor. A basic understanding of biochemistry and molecular biology is assumed.

SC ½ Course cr

CHEM 425b, Spectroscopic Methods of Structure Determination Martin Saunders

Applications of NMR, ESR, infrared, UV, visible, and mass spectroscopy to chemical problems concerning structures and reactions. X-ray crystallography. Computer simulation of NMR spectra. Prerequisites: two terms of organic chemistry and CHEM 333. SC RP

CHEM 432a, 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 433a, 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 437a, Chemistry of Isotopes Martin Saunders

Advanced applications of isotopes to chemical problems and the theory associated with them, including kinetic and equilibrium isotope effects, tracer applications, and dating. RP

CHEM 466a, Introduction to Quantum Mechanics 1 Sharon Hammes-Schiffer

A half-term introduction to quantum mechanics, starting with the Schrödinger equation and covering model systems such as particle-in-a-box and harmonic oscillator. The fundamental postulates and theorems of quantum mechanics are also covered. Prerequisite: Physical chemistry, multivariable calculus or equivalent experience, or permission of instructor. SC ½ Course cr

CHEM 467a, Introduction to Quantum Mechanics 2 Sharon Hammes-Schiffer

Continuation of an introduction to quantum mechanics, starting with angular momentum and the hydrogen atom, and then covering approximate methods such as the variation method and perturbation theory. The concepts of electron spin as well as Hartree-Fock theory and other electronic structure methods for describing molecules are covered. Half-term course. Prerequisite: CHEM 467, or multivariable calculus or equivalent experience. SC ½ Course cr

*** CHEM 472a, 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 473a, 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 480a or b, Introduction to Independent Research in Chemistry** Nilay Hazari

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 490a 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 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 492a, 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 496b, Computational Chemistry Sharon Hammes-Schiffer

An introduction to modern computational quantum chemistry methods. The lectures cover Hartree-Fock theory, density functional theory, geometry optimizations, thermochemistry, transition states, minimum energy paths, continuum solvation models, electron correlation methods, and modeling excited states. Special emphasis on the hands-on use of computational packages for current applications spanning organic, inorganic, and biochemical reactions. After physical chemistry or with permission of instructor. QR, SC ½ Course cr

Child Study (CHLD)

* **CHLD 125a / EDST 125a / PSYC 125a, Child Development** Ann Close and Carla Horwitz

The reading of selected material with supervised participant-observer experience in infant programs, a day-care and kindergarten center, or a family day-care program. Regularly scheduled seminar discussions emphasize both theory and practice. An assumption of the course is that it is not possible to understand children – their behavior and development – without understanding their parents and the relationship between child and parents. The focus is on infancy as well as early childhood. Enrollment limited to juniors and seniors. WR, SO

* **CHLD 127b / EDST 127b / PSYC 127b, Theory and Practice of Early Childhood Education** Carla Horwitz

Development of curricula and responsive educational environments for young children – in light of current research and child development theory. The course focuses on critical analysis of programs for young children and the ways in which political context contributes to the practice of education. Regularly scheduled seminar discussions emphasize both theory and practice. Supervised participant-observer experience in an early childhood classroom. Components of the course include behavior and development, planning, assessment and standards, culture, teacher preparation, and working with families. Priority given to seniors, juniors and Ed Studies students. WR, SO RP

* **CHLD 128b / EDST 128b / PSYC 128b, Language, Literacy, and Play** Ann Close and Carla Horwitz

The course focuses on the complicated role play has in the development of language and literacy skills among preschool and kindergarten-aged children. It examines how teachers integrate language, literacy, and play in a developmentally appropriate early childhood education curriculum. Topics include social-emotional, cross-cultural, cognitive, and communicative aspects of play. WR, SO RP

* **CHLD 334a / PSYC 334a, Developmental Psychopathology** Fred Volkmar, Eli Lebowitz, and Denis Sukhodolsky

Study of developmental psychopathology during childhood and adolescence, team taught by a child psychiatrist and three psychologists. Topics include: aspects of normal development, assessment methods, clinical disorders, treatment, and legal and social policy issues. Review of normative development, followed by discussion of theoretical approaches to understanding developmental aspects of common mental health conditions in childhood. Attention to treatment models as well as relevant issues of culture and ethnicity in the expression of psychopathology. Prerequisites: PSYC 130, 140, 180, or equivalent, or with permission of instructor.

Chinese (CHNS)

* **CHNS 110a, 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 112a, 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 120b, Elementary Modern Chinese II** Staff

Continuation of CHNS 110. After CHNS 110 or equivalent. L2 RP 1½ Course cr

CHNS 122b, Elementary Modern Chinese for Heritage Speakers Staff

Continuation of CHNS 112. L2 1½ Course cr

*** CHNS 130a, 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 132a, 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 140b, Intermediate Modern Chinese II** Staff

Continuation of CHNS 130. To be followed by CHNS 150. After CHNS 130 or equivalent. L4 RP 1½ Course cr

*** CHNS 142b, Intermediate Modern Chinese for Heritage Speakers** Staff

Continuation of CHNS 132. After CHNS 132 or equivalent. L4 1½ Course cr

*** CHNS 150a, 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 151b, Advanced Modern Chinese II** Staff

Continuation of CHNS 150. After CHNS 150 or equivalent. L5

*** CHNS 152a and CHNS 153b, Advanced Modern Chinese for Heritage Speakers**
Staff

The third level of the advanced learner sequence. Intended for students with intermediate high to advanced low speaking and listening skills and with intermediate reading and writing skills. 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 158a and CHNS 159b, Advanced Modern Chinese III** 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 162a and CHNS 163b, Advanced Modern Chinese for Heritage Speakers III**
Wei Su

Intended for students with advanced speaking and listening skills and with advanced low reading and writing skills (able to write 1,000–1,200 characters). Further readings on contemporary life in China and Taiwan, supplemented with authentic video materials. Class discussion, presentations, and regular written assignments. Texts in simplified characters with vocabulary in both simplified and traditional characters. After CHNS 153 or equivalent. L5

*** CHNS 164a, Chinese for Reading Contemporary Fiction** Wei Su

Selected readings in Chinese fiction of the 1980s and 1990s. Development of advanced language skills in reading, speaking, and writing for students with an interest in literature and literary criticism. After CHNS 155, 162, or equivalent. L5

*** CHNS 165b, Readings in Modern Chinese Fiction** Wei Su

Reading and discussion of modern short stories, most written prior to 1949. Development of advanced language skills in reading, speaking, and writing for students with an interest in literature and literary criticism. After CHNS 155, 162, or equivalent. L5

*** CHNS 166a and CHNS 167b, Chinese for Current Affairs** William Zhou

Advanced language course with a strong focus on speaking and writing skills in formal style. Current affairs and issues in contemporary Chinese society explored through media forms such as news and blogs on the Internet, television, film, fine arts and so on. L5

*** CHNS 168a and CHNS 169b, Chinese for Global Enterprises** Min Chen

Advanced language course with a focus on Chinese business terminology and discourse. 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. After CHNS 155, 162, or equivalent. L5

CHNS 170a, 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. After CHNS 151, 153, or equivalent. L5

CHNS 171b, Introduction to Literary Chinese II Pauline Lin

Continuation of CHNS 170. After CHNS 170. L5

*** CHNS 172a, Chinese for Scholarly Conversation** Yongtao Zhang

This course aims to bring students to advanced competence in all aspects of modern Chinese, and prepare students for 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 scholar writers in related fields.

This level is suitable for students who have had four years of college Chinese prior to attending, or who have taken three years of an accelerated program meant for heritage speakers. Prerequisite: CHNS 155, CHNS 162, placement results equivalent to L5, or permission of instructor. L5

CHNS 200a / EALL 200a / EAST 240a / HUMS 270a, The Chinese Tradition Tina Lu

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 TR

Classical Civilization (CLCV)

*** CLCV 051a / HUMS 061a / LITR 029a / THST 051a, Performing Antiquity** Pauline LeVen

This seminar introduces students to some of the most influential texts of Greco-Roman Antiquity and investigates the meaning of their “performance” in different ways: 1) how they were musically and dramatically performed in their original context in Antiquity (what were the rhythms, the harmonies, the dance-steps, the props used, etc.); 2) what the performance meant, in socio-cultural and political terms, for the people involved in performing or watching it, and how performance takes place beyond the stage; 3) how these texts are performed in modern times (what it means for us to translate and stage ancient plays with masks, a chorus, etc.; to reenact some ancient institutions; to reconstruct ancient instruments or compose “new ancient music”); 4) in what ways modern poems, plays, songs, ballets constitute forms of interpretation, appropriation, or contestation of ancient texts; 5) in what ways creative and embodied practice can be a form of scholarship. Besides reading ancient Greek and Latin texts in translation, students read and watch performances of modern works of reception: poems, drama, ballet, and instrumental music. A few sessions are devoted to practical activities (reenactment of a symposium, composition of ancient music, etc.). Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** CLCV 052b, The Myths of Oedipus** Christina Kraus

Study of different versions of the Oedipus myth, beginning with Sophocles' three plays (*Oedipus the King*, *Antigone*, and *Oedipus at Colonus*) and including modern adaptations such as those by Cocteau (*The Infernal Machine*), Fugard (*The Island*), and Dove (*The Darker Face of the Earth*); we also consider filmed adaptations such as Martha Grahame's "Night Journey" (1947), *The Gospel at Colonus* (1984), and *Oedipo alcalde* (1996). Secondary material, including works by cultural, psychological, and literary critics, provide background for the literary works. Readings, writing exercises, and discussion aim both to elucidate the original context of the plays in fifth-century Athens and to understand their contested and still vigorous place in the canon and in the western humanities. All readings in English. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

CLCV 114a / AFAM 114a / HUMS 114a / LITR 155a, Rhetoric, A User's Guide (from Ancient Greece to the American Present) Emily Greenwood Milne

This course explores the classical rhetorical tradition and the various ways in which it has been adapted in modern American rhetoric up to the present. We analyze rhetorical theory and practice in ancient Greece and Rome, using classical rhetoric as a lens through which to explore the craft of speech in American history, and vice versa. Students emerge from this course able to tell *aposiopesis* from *praeteritio*, but rather than dry lectures on the history of rhetoric, the approach in lectures and section discussions is comparative through and through, staging curious conversations between ancient and modern as we examine the paths of words through history. We consider what makes individual speeches noteworthy in their local, historical contexts, as well as within a wider rhetorical tradition, and we analyze the role of ideologies of gender, race, class, education, nationality, religion, and sexuality in the construction of the rhetorical subject. In addition, the classical rhetorical tradition of Greece and Rome is compared and contrasted with parallel traditions of classical rhetoric in ancient China and India. Due attention is paid to methodological problems in the history of rhetoric and debates in rhetorical theory. WR, HU

CLCV 125a / PHIL 125a, Introduction to Ancient Philosophy Brad Inwood

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

CLCV 205a / HIST 205a, Introduction to Ancient Greek History Jessica Lamont

Introduction to Greek history, tracing the development of Greek civilization as manifested in the political, military, intellectual, and creative achievements from the Bronze Age through the end of the Classical period. Students read original sources in translation as well as secondary scholarship to better understand the rise and fall of the ancient Greeks—the civilization at the very heart of Western Civilization. HU

CLCV 206a / HIST 217a / HUMS 144a, The Roman Republic Andrew Johnston

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

CLCV 207b / HIST 218b, 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

*** CLCV 216a / LITR 239a / MGRK 216a / WGSS 209a, 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

CLCV 219a / HIST 311a / NELC 311a, Egypt of the Pharaohs Joseph Manning and Nadine Moeller

Egypt was among the first centralized territorial states in the world, and, because Egyptian history offers us 4000 years of institutional development and change, the focus of this course is on the long-term development of the ancient Egyptian state, its institutions, and its culture. The course introduces students to the history and culture of ancient Egypt from the rise of the central state to the early Christian period. General historical trends, the relationship of Egyptian history to other contemporary ancient cultures, and the legacy of Egypt to the “West” are also considered. At the end of the course, students have an understanding of the material culture and the historical development of ancient Egypt, and an appreciation for the relationship of the ancient sources to the construction of ancient Egyptian history. HU

CLCV 236b / HIST 225b, Roman Law Noel Lenski

Basic principles of Roman law and their applications to the social and economic history of antiquity and to the broader history of international law. Topics include the history of persons and things, inheritance, crime and tort, and legal procedure. Questions of social and economic history and the history of jurisprudence from the fifth century B.C.E. to the present. HU

CLCV 261a / PHIL 200a, Plato Staff

Focus on the central philosophical themes in the work of Plato and on methodology for studying Plato. Some prior philosophical study of Plato is recommended, such as PHIL/CLCV 125 or DRST 003. HU

*** CLCV 305a / GMAN 489a / HSAR 489a, Pathos-Figures: Affection-Images in the Visual Arts** Nicola Suthor

Images with high pathos inform our perception of human life and define our stance in the world. The seminar wants to foster a critical awareness of the formative power that pathos figures exert on our moral beliefs concerning human behavior. The course covers the timespan from Antiquity to Modernity in Western culture and deals with historical moments that reflect different attempts to cultivate and temper strong emotions. We discuss the transfer of pathos and how the dissemination of eminent pathos figures of antiquity have shaped the imagery of the Western canon; we tackle with one of the most far-reaching concepts of art history, Aby Warburg's Pathos formula that encourages us to draw in broad strokes connecting lines of affection over centuries and different cultures; we look into the discourse on human suffering in Medieval times and how it has defined the Christian doctrine of the affective image; we have a close look at treatises of the 17th century that worked on theorizing human passions and discuss the Enlightenment perspective that aimed at interiorizing pathos by dint of the discourse of beauty; we discuss the Modern "close-up" and how it unfolds the moment of pure bodily presence as highly affective entity. We ask if we are in need of new pathos images that reflect our current emotional stakes, and how they might look. HU

*** CLCV 307a / ANTH 128a / RLST 128a, Emotion and Identity in Antiquity** Daniel Eastman

“You are what you feel.” But how much control do we have over how we feel? Does – or can – everyone experience the world through the same categories of feeling, or “emotions”? To what extent are people’s emotional options constrained or scripted by aspects of identity such as religion, gender, class, and language? This seminar

explores the connections between emotions and identity in the context of the ancient Mediterranean world, with reference to modern theories of emotion along the way. Topics covered include (1) ancient theories of what emotions are and how they relate to the "self"; (2) norms concerning which emotions are "proper" and for whom (including humans, animals, and gods; women and men; and "pagans," Jews, and Christians); and (3) practical methods used to cultivate certain emotions over others.

HU

*** CLCV 313a / WGSS 316a, Women Who Kill** Ariel Kroeber

Women in ancient Greek mythology are often figured as killers and destroyers: of enemies, husbands, children, and cities. We read the ancient plays and poetry that depict these women, as well as modern reworkings and retellings of these stories. We explore how these texts understand women and femininity, why the connection between women and murder is so ubiquitous in Greek mythology, and what it means that the ancient authors we read – all of whom were men – so often returned to this theme. In addition to ancient authors, we read contemporary works of poetry and fiction that draw on these mythological stories and rework them in new ways. In the ancient sources we see authors reworking still older variations of the same stories, revealing the modern adaptations as a continuation of this process, remaking the stories once again. What can the approaches taken by our contemporary mythmakers to the murderous woman tell us about our own societies? WR, HU

*** CLCV 316b, Identity, Power, and Practice in Classical Studies** Staff

To study Greco-Roman antiquity in the twenty-first century is not a neutral proposition. For elementary language-learners and professional scholars alike, "doing Classics" entails close encounters with systems of power and legacies of oppression. Too often the ethical questions provoked by such encounters are sidelined or relegated to forums for graduate students and faculty. This course, a proseminar for undergraduates, aims to create a curricular space for reckoning with the shape and history of the discipline. It takes modern categories of difference, such as race, gender, sexuality, and status, as organizing principles for examining the ancient world, its subsequent receptions, and the politics of its study. WR, HU

*** CLCV 319b / HIST 242Jb / MGRK 300b / WGSS 293b, 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

*** CLCV 450a, Two-Term Senior Project for the Major in Classical Civilization**

Andrew Johnston

Qualified students may write a two-term senior essay under the guidance of a faculty adviser. An appropriate instructor is assigned to each student by the director of undergraduate studies in consultation with the student. In the first term, selected readings compensate for individual deficiencies and help the student achieve a balanced overview. In the second term, students select a topic for research from any area of the

literature, history, culture, or philosophy of ancient Greece, Rome, or Hellenistic Egypt, or a topic from the classical tradition.

*** CLCV 452a, One-Term Senior Project for the Major in Classical Civilization**

Andrew Johnston

A one-term senior project. Students select a topic for research from any area of the literature, history, culture, or philosophy of ancient Greece, Rome, or Hellenistic Egypt, or a topic from the classical tradition. An appropriate instructor is assigned to each student by the director of undergraduate studies in consultation with the student.

Classics (CLSS)

Cognitive Science (CGSC)

CGSC 110a / PSYC 130a, 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 216b / LING 116b / PSYC 116b, Cognitive Science of Language Robert Frank

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 275b / LING 275b / PHIL 280b, Pragmatics Laurence Horn

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 282b / PHIL 182b / PSYC 182b, Perspectives on Human Nature Joshua Knobe

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

CGSC 352a / NSCI 352a / PSYC 352a, Arrested or Adaptive Development of the Adolescent Brain BJ Casey

Study of empirical and theoretical accounts of adolescent-specific changes in the brain and in behavior that relate to the development of self control. Discussions will focus on adaptive and arrested adolescent brain development in the context of relevant legal, social, and health policy issues. Prerequisites: PSYC 110, PSYC 160. SC

* **CGSC 395a / PHIL 395a, Junior Colloquium in Cognitive Science** Staff

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 419b / NSCI 419b / PSYC 419b, Topics in Brain Development, Law, and Policy** BJ Casey

Healthy development is a fundamental right of the individual, regardless of race, ethnicity, socioeconomic status, or gender. Youth require special protections of their rights due to vulnerabilities related to their physical and mental immaturity. These rights include, not only protections, but opportunities for building the cognitive, emotional, and social skills necessary for becoming a healthy adult and a contributing member of society. This seminar examines the extent to which legal policies and practices in the treatment of youths are consistent with scientific knowledge on psychological and brain development. Each class discusses one or more legal cases highlighted in the context of brain and psychological science and current laws and policies. Prerequisite: PSYC 110 and PSYC 160 preferred. SO

* **CGSC 420b / NSCI 440b / PSYC 420b, Topics in Clinical Neuroscience** Avram Holmes

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 427b / PSYC 427b, The Rise and Fall of Wonder: When Early Passions for Exploration and Discovery Decay with Age** Frank Keil

Research on children's minds reveals early emerging abilities that help explain the developmental origins and early growth of wonder. We consider wonder as the joy of exploration and discovery. Preschoolers and even infants are driven to learn not just facts and statistics, but also underlying causal patterns that are at the heart of many sciences. They learn not just as individual but also as members of knowledge communities and, early on, they sense how to "harvest" knowledge from these communities. Yet, those joyous moments of discovery and exploration often fade as children grow older and cease to wonder. We explore how this decline occurs and its consequences. When people stop wondering, they fail to expand their grasps of the world and become ever more vulnerable to misunderstanding and manipulation by others. We examine possible ways to reverse the decline. Prerequisite: PSYC 110 or CGSC 110. SO

* **CGSC 437b / PSYC 437b, Minds, Brains, and Machines** Julian Jara-Ettinger
Exploration of the implications that the brain is a kind of computer that gives rise to the mind. Readings combine classical and cutting-edge research in psychology, philosophy, and artificial intelligence. SO RP

* **CGSC 439a / PSYC 439a, The Psychology of Social Construction** Yarrow Dunham
We live in a world replete with “forgeries that become genuine”: pieces of paper that become money, words that become promises, lines in the sand that become borders. Nearly every aspect of our lives is shaped and constrained by these kinds of socially constructed entities, things as real as mountains but far more mysterious. How do such entities come to be, and how do (and how should) we understand them? How are they made and how can they be contested when they go astray? Answering these questions requires ranging across diverse literatures beginning with psychology but including philosophy, anthropology, economics, and game theory. Prerequisite: PSYC 110 or CGSC 110. SO

* **CGSC 471a and CGSC 472b, Directed Research in Cognitive Science** Staff
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 473a and CGSC 474b, Directed Reading in Cognitive Science** Staff
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 491b, Senior Project** Staff
A research colloquium leading to the completion of the senior essay. Students attend regular colloquium presentations. Enrollment limited to Cognitive Science majors.

Comparative Literature (LITR)

* **LITR 022a, Music and Literature** Candace Skorupa
This seminar explores the rivalry between music and literature, the attraction and repulsion between these two art forms, and the dialogue between writers and composers. In select fiction and poetry spanning a variety of cultures and times, we look at the aesthetic challenges of conveying music in words; in select music from the same periods, we study the use of literary themes and narrative. How does music inhabit literature, and literature influence music? We read fiction describing music and borrowing musical forms; we study symphonies and opera inspired by

literature; we look at films that bring together these two arts. Students examine theoretical approaches and learn comparative methods useful for literature and culture courses. Though not required, musical experience and/or interest is welcomed for the seminar, which may be taken simultaneously with gateway courses in the humanities. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

* **LITR 026a, The Literature of Sports** Robyn Creswell

Writers on sport examine ideas of beauty and human divinity; virtuosic performance; group identity; questions of race, class, and gender; global realities of migration; and the ubiquity of spectacle. Topics include origins and essence of play; and case studies in the literature of sports, including the Olympic games of classical Greece, bull fighting, Muhammad Ali, cricket and colonialism, and the globalization of soccer. Readings by Pindar, Hemingway, Huizinga, CLR James, Mailer, Delillo, Foster-Wallace, and Ben Fountain. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

* **LITR 027a / HUMS 027a, Six Pretty Good Selves** Ayesha Ramachandran and Marta Figlerowicz

Through the prism of thinking about the self, this course provides first-year students with an intensive introduction to studying the humanities at Yale. The course is anchored around six trans-historical models of thinking about selfhood: the ideal self, the lover, the revolutionary, the convert, the solipsist, and the social climber. We range widely across genres, media, periods, and geographies: from Plato's *Symposium* to Machado de Assis's *Epitaph for a Small Winner*, from the ghazals of Hafiz to the *Kamasutra*. We also make extensive use of Yale's rich manuscript archives, historical object collections, and art galleries and devote sustained attention to improving students' academic writing skills. Friday sessions will alternate between writing workshops and field trips to Yale collections. WR, HU 1½ Course cr

* **LITR 028a / HUMS 029a, 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). Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

* **LITR 029a / CLCV 051a / HUMS 061a / THST 051a, Performing Antiquity** Pauline LeVen

This seminar introduces students to some of the most influential texts of Greco-Roman Antiquity and investigates the meaning of their “performance” in different ways: 1) how they were musically and dramatically performed in their original context in Antiquity (what were the rhythms, the harmonies, the dance-steps, the props used, etc.); 2) what the performance meant, in socio-cultural and political terms, for the people involved in performing or watching it, and how performance takes place beyond the stage; 3) how these texts are performed in modern times (what it means for us to translate and stage ancient plays with masks, a chorus, etc.; to reenact some

ancient institutions; to reconstruct ancient instruments or compose “new ancient music”); 4) in what ways modern poems, plays, songs, ballets constitute forms of interpretation, appropriation, or contestation of ancient texts; 5) in what ways creative and embodied practice can be a form of scholarship. Besides reading ancient Greek and Latin texts in translation, students read and watch performances of modern works of reception: poems, drama, ballet, and instrumental music. A few sessions are devoted to practical activities (reenactment of a symposium, composition of ancient music, etc.). Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

* **LITR 130a / HUMS 130a, How to Read** Rudiger Campe and Hannan Hever
Introduction to techniques, strategies, and practices of reading through study of lyric poems, narrative texts, plays and performances, films, new and old, from a range of times and places. Emphasis on practical strategies of discerning and making meaning, as well as theories of literature, and contextualizing particular readings. Topics include form and genre, literary voice and the book as a material object, evaluating translations, and how literary strategies can be extended to read film, mass media, and popular culture. Junior seminar; preference given to juniors and majors. HU

* **LITR 140b, How To Compare** Jane Tylus
This course is an exploration of literary comparison from methodological as well as historical perspectives. We compare texts within genres, across genres and media, across periods, and between cultures and languages. We consider questions such as whether all comparisons must assume a common ground, and whether there is always an implicit politics to any comparison. Topics range from theories of translation and ekphrasis to exoticism and untranslatability. Readings include classics by critics such as Aristotle, Ibn Sina, and Kristeva, and writers such as Marie de France, Nezami, and Calvino. It also engages with the literature of our own moment: we will read a newly-translated novel by the Chilean writer Nona Fernández, and the Iranian poet Kayvan Tahmasebian will visit the class for a conversation. We will also discuss films (Parajanov and Barta) and a new Russian computer game. This course fulfills an introductory requirement for students considering one of the majors in the Comparative Literature department, but all are welcome, and the methodologies and questions discussed in the class are useful for any kind of humanistic inquiry. HU

* **LITR 154b / ENGL 395b / HUMS 380b, 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

LITR 155a / AFAM 114a / CLCV 114a / HUMS 114a, Rhetoric, A User's Guide (from Ancient Greece to the American Present) Emily Greenwood Milne
This course explores the classical rhetorical tradition and the various ways in which it has been adapted in modern American rhetoric up to the present. We analyze rhetorical theory and practice in ancient Greece and Rome, using classical rhetoric as a lens through which to explore the craft of speech in American history, and vice versa. Students emerge from this course able to tell *aposiopesis* from *praeteritio*, but rather than dry lectures on the history of rhetoric, the approach in lectures and section discussions is comparative through and through, staging curious conversations between ancient and modern as we examine the paths of words through history. We consider what makes individual speeches noteworthy in their local, historical contexts, as well as

within a wider rhetorical tradition, and we analyze the role of ideologies of gender, race, class, education, nationality, religion, and sexuality in the construction of the rhetorical subject. In addition, the classical rhetorical tradition of Greece and Rome is compared and contrasted with parallel traditions of classical rhetoric in ancient China and India. Due attention is paid to methodological problems in the history of rhetoric and debates in rhetorical theory. WR, HU

*** LITR 168a or b / ENGL 129a or b / HUMS 127a or b / THST 129a or b, Tragedy in the European Literary Tradition** Staff

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. WR, HU

*** LITR 169a or b / ENGL 130a or b, Epic in the European Literary Tradition** Staff

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. WR, HU

*** LITR 180b / HUMS 210b / ITAL 317b / WGSS 317b, Women in the Middle Ages**
Christiana Purdy Moudarres

Medieval understandings of womanhood examined through analysis of writings by and/or about women, from antiquity through the Middle Ages. Introduction to the premodern Western canon and assessment of the role that women played in its construction. HU

*** LITR 181a / EALL 236a, Japanese Poetry and Poetics** Edward Kamens

Core concepts and traditions of classical Japanese poetry explored through the medium of translation. Readings from anthologies and treatises of the ninth through early twentieth centuries. Attention to recent critical studies in transcultural poetic theory. Inspection and discussion of related artifacts in the Beinecke Rare Book and Manuscript Library and the Yale University Art Gallery. Readings and discussion in English. No knowledge of Japanese required. Previous study of literary texts is recommended but not required. WR, HU

LITR 183a / HUMS 180a / ITAL 310a, Dante in Translation Christiana Purdy Moudarres

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 TR

LITR 194a / ENGL 154a / FREN 216a / HUMS 134a, The Multicultural Middle Ages

Ardis Butterfield and Marcel Elias

Introduction to medieval English literature and culture in its European and Mediterranean context, before it became monolingual, canonical, or author-bound. Genres include travel writing, epic, dream visions, mysticism, the lyric, and autobiography, from the Crusades to the Hundred Years War, from the troubadours to Dante, from the *Chanson de Roland* to Chaucer. Formerly ENGL 189. WR, HU

* **LITR 195b / ENGL 205b / HUMS 200b / MUSI 462b, 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

LITR 214b / FREN 240b / HUMS 201b, The Modern French Novel Maurice Samuels and Alice Kaplan

A survey of major French novels, considering style and story, literary and intellectual movements, and historical contexts. Writers include Balzac, Flaubert, Proust, Camus, and Sartre. Readings in translation. One section conducted in French. HU TR

* **LITR 220b / CZEC 301b / RSEE 300b, Milan Kundera: The Czech Novelist and French Thinker** Karen von Kunes

Close reading of Kundera's novels, with analysis of his aesthetics and artistic development. Relationships to French, German, and Spanish literatures and to history, philosophy, music, and art. Topics include paradoxes of public and private life, the irrational in erotic behavior, the duality of body and soul, the interplay of imagination and reality, the function of literary metaphor, and the art of composition. Readings and discussion in English. HU TR

* **LITR 224a / FREN 403a / HUMS 409a, Proust Interpretations: Reading Remembrance of Things Past** R Howard Bloch and Pierre Saint-Amand

A close reading (in English) of Marcel Proust's masterpiece, *Remembrance of Things Past*, with emphasis upon major themes: time and memory, desire and jealousy, social life and artistic experience, sexual identity and personal authenticity, class and nation. Portions from *Swann's Way*, *Within a Budding Grove*, *Cities of the Plain*, *Time Regained* considered from biographical, psychological/psychoanalytic, gender, sociological, historical, and philosophical perspectives. WR, HU TR

* **LITR 235b / JDST 329b, Modern Jewish Poets** Peter Cole

This course introduces students to a diverse group of modern Jewish poets—from Gertrude Stein, Moyshe Leyb-Halpern, and Adrienne Rich to Muriel Rukeyser, Yehuda Amichai, Paul Celan, Edmond Jabès, Leonard Cohen, and others. Writing in English, Yiddish, German, Hebrew, and French, these poets gave seminal expression to Jewish life in a variety of modes and permutations, and in the process produced poems of lasting and universal value. The class explores work as art and considers pressing questions of cultural, historical, and political context. All readings are in English. HU TR

* **LITR 239a / CLCV 216a / MGRK 216a / WGSS 209a, 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

* **LITR 240a or b / GMAN 248a or b / HUMS 236a or b / THST 248a, Goethe's Faust**

Kirk Wetters and Jan Hagens

Goethe's *Faust*, with special attention to *Faust II* and to the genesis of *Faust* in its various versions throughout Goethe's lifetime. Emphasis on the work in context of Goethe's time and in the later reception and criticism. Reading knowledge of German beneficial but not required. HU

LITR 245a / RSEE 254a / RUSS 254a, Tolstoy and Dostoevsky Molly Brunson
Close reading of major novels by two of Russia's greatest authors. Focus on the interrelations of theme, form, and literary-cultural context. Readings and discussion in English. HU

* **LITR 251b / EALL 265b / EAST 253b, Japanese Literature after 1970** Timothy Goddard

This course provides a survey of Japanese literature from 1970 to the present. Readings include novels and essays from a diverse range of authors, addressing themes such as identity, language, memory, domesticity, postmodernism, and racial discrimination. Students develop extensive knowledge of contemporary Japanese literature, while also cultivating skills in close reading and research methods. All readings are in English translation; no knowledge of Japanese is required. HU TR

* **LITR 262a / GMAN 414a / HUMS 414a, Georg Büchner's Revolutions** Rudiger Campe

Georg Büchner's (1813-1837) is a work across times and places. In *Danton's Death* he reenacts the French Revolution, in the pamphlet *Hessian Messenger* he calls for revolution in German lands. Büchner's other, simultaneous, revolution is one of language and literature. In the narrative *Lenz* and the theater play *Woyzeck*, Büchner turns the Romanticism of his own time upside down and the two works resurface only ca. 1900 as trail blazers of social naturalism and modernist (postdramatic) theater. Celan, in the *Meridian*, gives an idiosyncratic account of Büchner's travel across times and places. The course contextualizes the close reading of Büchner's work with materials from the French Revolution, early socialists, Marx; French, German, British Romanticism; prose and theater ca. 1900 when Büchner is rediscovered; Celan. HU

* **LITR 267b / ARBC 171b / ARBC 527b / MMES 177b / NELC 237b / NELC 598b, Hunger in Eden: Mohamed Choukri's Narratives** Jonas Elbousty

A survey of the work of Mohamed Choukri, one of the most prominent Moroccan, if not Arab, writers to have shaped the modern Arabic literary canon. His influence has been instrumental in forming a generation of writers and enthusiastic readers, who fervently cherish his narratives. Students dive deeply into Choukri's narratives, analyzing them with an eye toward their cultural and political importance. The class looks to Choukri's amazing life story to reveal the roots of his passion for writing and explores the culture of the time and places about which he writes. Through his narratives, students better understand the political environment within which they were composed and the importance of Choukri's work to today's reader regarding current debates over Arab identity. This class surveys the entirety of his work,

contextualizing within the sphere of Arabic novelistic tradition. Prerequisite: ARBC 151, L4 or equivalent, or permission from the of instructor. L5

* **LITR 269b / AFST 414b / FREN 414b / MMES 261b, Afterlives of Algeria's Revolution** Jill Jarvis

The Algerian War for Independence from France was the longest and most violent decolonizing war of the 20th century. This war and its aftermath transformed political, social, intellectual, and artistic life on both sides of the Mediterranean—and it became a model for other decolonizing and civil rights movements across the world. Memory of this war continues to shape current debates in Europe and North Africa about state violence, terrorism, racism, censorship, immigration, feminism, human rights, and justice. Through study of fiction, film, testimonies, graphic novels, and theater, this seminar charts the war's surprising and enduring legacies. Films may include Pontecorvo's *The Battle of Algiers*, Haneke's *Caché*, and Panijel's *Octobre à Paris*. Literary works by Djébar, Camus, Sebbar, Etcherelli, Dib, Cixous, Kateb, Fanon, De Beauvoir, Mechakra. The course is conducted in French. If you have any questions about your French ability, contact the instructor. L5, HU

* **LITR 273a / HUMS 215a, The Poetry of Vision: East and West** Riley Soles
Samuel Johnson's Dictionary of 1755 provides four definitions of the word vision: (1) sight; the faculty of seeing, (2) the act of seeing, (3) a supernatural appearance; a spectre; a phantom, (4) a dream; something in a dream. A dream happens to a sleeping man, a vision may happen to a waking man. A dream is supposed natural, a vision miraculous; but they are confounded. This course explores poetry that deals with any or all of these definitions, across a wide range of cultural and historical contexts, from the visionary, astral journeys of ancient Chinese verse to the visionary, redemptive apocalypse of William Blake, from the fleeting beauty in Japanese haiku to the high Sublime of American shore odes, from the psychedelic sermons of Buddhist scripture to the dream images of Geoffrey Chaucer, from the divine, cosmic manifestation in the *Bhagavad Gita* to the non-linear, multilayered poetics of Stéphane Mallarmé, from the spiritual and erotic yearnings of Rumi to the romantic and poetic longings of Hart Crane. HU

* **LITR 294a / LAST 394a / PORT 394a, World Cities and Narratives** Kenneth David Jackson

Study of world cities and selected narratives that describe, belong to, or represent them. Topics range from the rise of the urban novel in European capitals to the postcolonial fictional worlds of major Portuguese, Brazilian, and Lusophone cities. Conducted in English. WR, HU TR

* **LITR 295a / AFAM 352a / AMST 438a / ER&M 291a / WGSS 343a, Caribbean Diasporic Literature** Fadila Habchi

An examination of contemporary literature written by Caribbean writers who have migrated to, or who journey between, different countries around the Atlantic rim. Focus on literature written in English in the twentieth and twenty-first centuries, both fiction and nonfiction. Writers include Caryl Phillips, Nalo Hopkinson, and Jamaica Kincaid. HU

* **LITR 296b / LAST 392b / PORT 392b, Brazil's Cannibal Modernism: From Modern Art Week to Antropofagia** Kenneth David Jackson

A study of Brazilian modernism in literature and the arts, centered on São Paulo's "Modern Art Week" of 1922 and the "Cannibal Manifesto" from the perspective of major figures and works, and transatlantic exchanges with figures from the European avant-gardes. Includes analysis of *antropofagia* as a post-colonial strategy. Reading knowledge of French and Portuguese helpful but not required. WR, HU TR

* **LITR 301a / FILM 360a / RSEE 380a / RUSS 380a, Putin's Russia and Protest Culture** Marijeta Bozovic

Survey of Russian literature and culture since the fall of communism. The chaos of the 1990s; the solidification of power in Putin's Russia; the recent rise of protest culture. Sources include literature, film, and performances by art collectives. Readings and discussion in English; texts available in Russian. WR, HU

* **LITR 302b / FREN 307b, France by Rail: Trains in French Literature, Film, and History** Morgane Cadieu

Exploration of the aesthetics of trains in French and Francophone literature and culture, from the end of the nineteenth-century and the first locomotives, to the automatically driven subway in twenty-first century Paris. Focus on the role of trains in industrialization, colonization, deportation, decolonization, and immigration. Corpus includes novels, poems, plays, films, paintings, graphic novels, as well as theoretical excerpts on urban spaces and public transportation. Activities include: building a train at the CEID and visiting the Beinecke collections and the Art Gallery. May not be taken after FREN 306. WR, HU

* **LITR 305a / ENGL 483a / HUMS 428a / JDST 343a, Advanced Literary Translation** Robyn Creswell

A sequel to LITR 348, The Practice of Literary Translation. Students apply to this workshop with a project in mind that they have been developing, either on their own or for a senior thesis, and they present this work during the class on a regular basis. Practical translation is supplemented by readings in the history of translation practice and theory, and by the reflections of practitioners on their art. These readings are selected jointly by the instructor and members of the class. Topics include the history of literary translation – Western and Eastern; comparative approaches to translating a single work; the political dimension of translation; and translation in the context of religion and theology. Class time is divided into student presentations of short passages of their own work, including related key readings; background readings in the history of the field; and close examination of relevant translations by accomplished translators. Students receive intensive scrutiny by the group and instructor. Prerequisite: LITR 348.

LITR 318b / ENGL 191b / HUMS 206b / MMES 215b / NELC 201b, The Arabian Nights, Then and Now Robyn Creswell

Exploration of *Arabian Nights*, a classic of world literature. Topics include antecedents, themes and later prose, and graphic and film adaptations. HU

* **LITR 335a / ER&M 441a / PORT 341a, Crossing Cultures in the Portuguese Diaspora** Kenneth David Jackson

Inquiry into the first encounters of the Portuguese with the people and cultures of Africa, Asia, and Brazil after the voyage of Vasco da Gama (1497-99). Topics include acculturation, contact peoples and languages, creolistics and hybrid cultures, music,

plants and cuisines, and the theory of space in between cultures. Readings include the epic, histories, memoirs, and travel literature, and the “Cannibal Manifesto.” Reading knowledge of Portuguese suggested. WR, HU TR

LITR 339b / ENGL 159b / HUMS 213b / THST 262b, Global Shakespeares: Race,

Gender, and the Idea of the Human Ayesha Ramachandran

Shakespeare today is a global phenomenon: over five hundred years after his death, the playwright’s legacy continues to flourish with new performances, reworkings, appropriations, and adaptations continuously produced across the world in a range of languages and across various media. Once exported along with the ideologies and practices of empire, Shakespeare’s works have now become an index for the complex histories of colonialism and postcolonialism as well as a crucial site for studying processes of racialization and the universalizing idea of “the human.” How did Shakespeare become global? Was the cultural imagination of his plays always already global, written at a time with the very notion of the modern world as we know was being shaped? This course explores the political afterlives of “Shakespeare” as a cultural icon and aesthetic touchstone for the Western tradition through a close reading of four plays alongside their adaptations: *Hamlet*, *Othello*, *King Lear*, and *Antony and Cleopatra*. We look at films, novels, *manga* comics, memoirs, stand-up comic routines, along with classic stagings of the plays to elucidate the themes that have made Shakespeare global – in particular, questions of race, gender, sexuality, generational conflict, and political intrigue. Authors and directors include Akira Kurosawa, Vishal Bharadwaj, Janet Suzman, Iqbal Khan, James Baldwin, Sulayman Al-Bassam, Tayeb Salih, Preti Taneja, and Derek Walcott. This is the non-intensive writing version of LITR 340 and is worth 1 credit. It meets with LITR 340. Students may earn credit for LITR 339 (1 credit) or for LITR 340 (1.5 credits) but not for both. WR, HU

*** LITR 345a / EVST 228a / HIST 459Ja / HUMS 228a, 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

*** LITR 348b / ENGL 456b / HUMS 427b / JDST 316b, The Practice of Literary**

Translation Peter Cole

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 from 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. HU

LITR 351b / FILM 333b, Early Film Theory and Modernity Francesco Casetti

Introduction to film theory from its beginnings to c. 1930, including its emphasis on the spectator's experience. Ways in which early theory highlighted characteristics of modern life such as speed, economy, contingency, and excitation. The role of national identity in defining topics of theoretical research explored through comparison of American and European debates. HU

* **LITR 359b / FILM 457b / ITAL 303b, Italian Film from Postwar to Postmodern**
Millicent Marcus

A study of important Italian films from World War II to the present. Consideration of works that typify major directors and trends. Topics include neorealism, self-reflexivity and metacinema, fascism and war, and postmodernism. Films by Fellini, Antonioni, Rossellini, De Sica, Visconti, Pasolini, Bertolucci, Wertmuller, Tornatore, and Moretti. Films in Italian with English subtitles. WR, HU

* **LITR 360a / FILM 363a / LAST 360a, Radical Cinemas of Latin America** Moira Fradinger

Introduction to Latin American cinema, with an emphasis on post-World War II films produced in Cuba, Argentina, Brazil, and Mexico. Examination of each film in its historical and aesthetic aspects, and in light of questions concerning national cinema and "third cinema." Examples from both pre-1945 and contemporary films. Conducted in English; knowledge of Spanish and Portuguese helpful but not required. HU

LITR 361a / FILM 305a, Animation: Disney and Beyond Aaron Gerow

Survey of the history of animation, considering both its aesthetics and its social potentials. The focus is on Disney and its many alternatives, with examples from around the world, from various traditions, and from different periods. HU

* **LITR 368a / FILM 319a / GMAN 273a, The Third Reich in Postwar German Film, 1945 to Present** Jan Hagens

Close study of the intersection of aesthetics and ethics with regard to how German films, since 1945, have dealt with Nazi history. Through the study of German-language films (with subtitles), produced in postwar East, West, and unified Germany, students consider and challenge perspectives on the Third Reich and postwar Germany, while learning basic categories of film studies. HU

* **LITR 369b / FILM 349b / HMRT 369 / LAST 369b, Gender Politics in Latin American Cinema** Moira Fradinger

Introduction to the contemporary politics of gender in Latin American cinema, with review of films from Argentina, Brazil, Colombia, Chile, Peru, Paraguay, Guatemala, Cuba, Venezuela and Mexico, and emphasis on how gender has been represented in a region with massive gender debates developing from the 1980s onwards. Topics include: discourses of human rights; representations of gay, transgender and intersex questions; social and economic status of women and feminized bodies; migration and indigenous peoples. Seminar is conducted in Spanish. Prerequisite: Level of L4. L5, HU

* **LITR 382a / FILM 419a / GMAN 368a, German New Waves in Cold War Europe**
Katie Trumpener

Comparative study of New Wave cinema in East and West Germany, with a focus on aesthetic ferment, institutional barriers, and transformation. Berlin as the best place to follow Europe's emerging cinematic New Waves before 1961. Distinctive approaches developed by young filmmakers in East and West Germany to political and

documentary filmmaking, to the Nazi past and the Cold War, and to class, gender, and social transformation. Knowledge of German helpful but not necessary. WR, HU

* **LITR 402b / ENGL 329b / HSAR 441b / HUMS 371b, The Picturebook: Euro-American and Japanese Traditions** Katie Trumpener

Examines the form, history, and preoccupations of the picturebook form from the eighteenth century to the present, juxtaposing Euro-American with Japanese picturebook traditions. HU

* **LITR 461a / AFST 295a / ENGL 295a, Postcolonial Ecologies** Cajetan Iheka

This seminar examines the intersections of postcolonialism and ecocriticism as well as the tensions between these conceptual nodes, with readings drawn from across the global South. Topics of discussion include colonialism, development, resource extraction, globalization, ecological degradation, nonhuman agency, and indigenous cosmologies. The course is concerned with the narrative strategies affording the illumination of environmental ideas. We begin by engaging with the questions of postcolonial and world literature and return to these throughout the semester as we read the primary texts, drawn from Africa, the Caribbean, and Asia. We consider African ecologies in their complexity from colonial through post-colonial times. In the unit on the Caribbean, we take up the transformations of the landscape from slavery, through colonialism, and the contemporary era. Turning to Asian spaces, the seminar explores changes brought about by modernity and globalization as well as the effects on both humans and nonhumans. Readings include the writings of Zakes Mda, Aminatta Forna, Helon Habila, Derek Walcott, Jamaica Kincaid, Ishimure Michiko, and Amitav Ghosh. WR, HU

* **LITR 464a / GMAN 307a / HUMS 374a, Greed and Its Discontents: From Aristotle to the Present** Paul North

Money matters, whether we like it or not. Besides being an economic means, it plays a pervasive role in the lives of individuals and the social fabric at large—a role scrutinized by writers, philosophers, and cultural theorists. By opening up a vast horizon of possibilities, money represents power and desire. It is regarded as an enabler of freedom by some, and as a source of alienation by others. Money is said to be detrimental to social cooperation, as it fuels the “frenzy to achieve distinction” (Jean-Jacques Rousseau). When it comes to greed and its discontents, issues of status, recognition, and contempt come into play. Money, which has been called an “abstract” form of happiness (Arthur Schopenhauer), permeates the debates on the intricate relation between well-being, welfare, and wealth. On a macro level, the standings of different social spheres, including the economy, politics, and the realm of intimate relationships, depend on the question of whether “everything is for sale” or not (Debra Satz). In this course, we explore the meaning of money by tracing the arc from Aristotle to the present. HU

* **LITR 466a / FILM 429a / RUSS 465a, War in Literature and Film** Katerina Clark

Representations of war in literature and film; reasons for changes over time in portrayals of war. Texts by Stendahl, Tolstoy, Juenger, Remarque, Malraux, and Vonnegut; films by Eisenstein, Tarkovsky, Joris Ivens, Coppola, Spielberg, and Altman. HU

* **LITR 477b / AMST 379b / ENGL 371b / FREN 371b, Fictions of Canada:**

Colonialism, Nationalism, Postcolonialism Katie Trumpener

This seminar explores the literature(s) of Canada in its long history, its considerable linguistic and cultural range, and its complex relationship to political history. 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. Particular focus on Canada's diverse early literatures (from Jesuit hymn to epistolary novel); on the prominent role of women writers across Canadian literature history; on the emergence of an experimental Québécois literature (utilizing Montreal patois as a new literary language) in an era also marked by secularization, modernization and political separatism; of English Canadian attempts to rethink colonial history, and the critiques of Canada's ongoing decolonization process by new generations of indigenous, immigrant and ethnic writers. This course explores both literary history and literary form; the work of internationally famous novelists and poets (Leonard Cohen, Marie-Claire Blais, Margaret Atwood, Alice Munro, Michael Ondaatje) and their innovative local counterparts. Throughout the semester, moreover, our discussion of written literary texts (poems, novels, plays) is supplemented by primarily oral texts, Canadian anthems, ballads, folk, rock and punk songs in a range of Canadian languages). We will thus listen to even as we read Canada. WR, HU

* **LITR 482a / GMAN 288a / HUMS 480a / PHIL 469a, The Mortality of the Soul:**

From Aristotle to Heidegger Martin Hagglund

This course explores fundamental philosophical questions of the relation between matter and form, life and spirit, necessity and freedom, by proceeding from Aristotle's analysis of the soul in *De Anima* and his notion of practical agency in the *Nicomachean Ethics*. We study Aristotle in conjunction with seminal works by contemporary neo-Aristotelian philosophers (Korsgaard, Nussbaum, Brague, and McDowell). We in turn pursue the implications of Aristotle's notion of life by engaging with contemporary philosophical discussions of death that take their point of departure in Epicurus (Nagel, Williams, Scheffler). We conclude by analyzing Heidegger's notion of constitutive mortality, in order to make explicit what is implicit in the form of the soul in Aristotle.

HU

* **LITR 483a / ENGL 248a / HSHM 476a / HUMS 430a / PHIL 361a, Thought**

Experiments: Connecting Literature, Philosophy and the Natural Sciences Paul Grimstad

The course looks closely at the intersection of literature, philosophy and natural science through the lens of the thought experiment. Do thought experiments yield new knowledge about the world? What role does narrative or scene setting play in thought experiments? Can works of literary fiction or films function as thought experiments? Readings take up topics such as personal identity, artificial intelligence, meaning and intentionality, free will, time travel, the riddle of induction, "trolley problems" in ethics and the hard problem of consciousness. Authors may include Mary Shelley, Plato, Albert Einstein, Franz Kafka, H.G. Wells, Rene Descartes, Kazuo Ishiguro, Rivka Galchen, Alan Turing, Hilary Putnam, as well as films (*The Imitation Game*) and television shows (*Black Mirror*). Students should have taken at least one course involving close analysis of works of literature or philosophy. WR,

HU

* **LITR 484a / AFST 443a / FREN 442a / MMES 402a, Decolonizing Memory : Africa & the Politics of Testimony** Jill Jarvis

This seminar explores the politics and poetics of memory in a time of unfinished decolonization. It also provides students with a working introduction to anticolonial, postcolonial, and decolonial critique. Together we bring key works on the topics of state violence, trauma, and testimony into contact with literary works and films by artists of the former French and British empires in Africa. Reading literary and theoretical works together permits us to investigate archival silences and begin to chart a future for the critical study of colonial violence and its enduring effects. Literary readings may include works by Djebbar, Rahmani, Ouologuem, Sebbar, Diop, Head, Krog. Films by Djebbar, Leuvre, Sembène, and Sissako. Theoretical readings may include works by Arendt, Azoulay, Césaire, Derrida, Fanon, Mbembe, Ngũgĩ, Spivak, and Trouillot. WR, HU

* **LITR 485a / ENGL 257a / GMAN 312a / HUMS 208a, Poe and Kafka** Caleb Smith and Paul North

Some mysteries seem unresolvable by science or religion. For instance, there is the mystery of how people remain hidden from themselves of repressed impulses and buried truths that find expression in fantasies, dreams, and other strange visions. A word for this mystery is the unconscious. Some terms for its literature include the gothic and the grotesque. Our experimental course pursues this mystery by studying two writers working in different languages, in different centuries, in a variety of minor, unprestigious genres: Edgar Allan Poe and Franz Kafka. We use tales and other short texts by each writer to illuminate the other's techniques for examining the psychological and political unconscious. WR, HU

* **LITR 487b / ENGL 213b / HUMS 209b, The Poetry of Wordsworth and Shelley** David Bromwich

An exploration of the major poems of William Wordsworth and Percy Shelley, with emphasis on the diverse imaginings required for lyrics and longer works such as *The Prelude* and *Prometheus Unbound*. WR, HU

* **LITR 488a or b, Directed Reading and/or Individual Research** Staff

Special projects in an area of the student's particular interest set up with the help of a faculty adviser and the director of undergraduate studies. Projects must cover material not otherwise offered by the department, must terminate in at least a term paper or its equivalent, and must have the approval of the director of undergraduate studies. Enrollment limited to Literature majors.

* **LITR 489a / GMAN 362a / HUMS 372a, 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

* **LITR 491a or b, The Senior Essay** Staff

An independent writing and research project. The senior essay is due in the office of the director of undergraduate studies according to the following schedule: (1) by September 3 (for LITR 491a) or January 14 (for LITR 491b), a three-page prospectus signed by the student's adviser; (2) by October 8 (for LITR 491a) or March 4 (for LITR 491b), a full rough draft (not notes); (3) by November 19 (for LITR 491a) or April 8 (for LITR 491b), the completed essay. The minimum length for an essay is twenty-five pages. Students are urged to arrange a topic and adviser early in the term before the term in which the essay is to be written.

* **LITR 492a or b and LITR 493a or b, The Yearlong Senior Essay** Staff

An extended research project. Students must petition the curriculum committee for permission to enroll by the last day of classes in the term preceding enrollment in LITR 492. For students expecting to graduate in May, the senior essay is due in the office of the director of undergraduate studies according to the following schedule: (1) by September 3, a three-page prospectus signed by the student's adviser; (2) by February 11, a full rough draft (not notes); (3) by April 8, the completed essay. December graduates should consult the director of undergraduate studies for required deadlines. The minimum length for a yearlong senior essay is forty pages.

Computer Science (CPSC)

* **CPSC 035b / MUSI 035b, 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. Preregistration required; see under First-Year Seminar Program. QR

CPSC 100a / CPSC S100, Introduction to Computing and Programming Cody Murphey

Introduction to the intellectual enterprises of computer science and to the art of programming. Students learn how to think algorithmically and solve problems efficiently. Topics include abstraction, algorithms, data structures, encapsulation, resource management, security, software engineering, and web development. Languages include C, Python, SQL, and JavaScript, plus CSS and HTML. Problem sets inspired by real-world domains of biology, cryptography, finance, forensics, and gaming. See CS50's website, <https://cs50.yale.edu>, for additional information. No previous programming experience required. Open to students of all levels and majors. QR

CPSC 112b, Introduction to Programming Timothy Barron

Development on the computer of programming skills, problem-solving methods, and selected applications. No previous experience with computers necessary. QR

* **CPSC 150a, 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 183a, 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 185b, 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 200a, 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 201a or b, Introduction to Computer Science Stephen Slade and 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 112 or equivalent. QR

CPSC 202a 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

CPSC 210b / PLSC 369b, Power, Security, and Surveillance: Political Challenges of the Computer Age Joan Feigenbaum

Twenty-first century societies are faced with both threats and opportunities that combine sophisticated computation with politics and international relations in critical ways. Examples include cyber warfare; cyber espionage; cyber crime; the role of social media in democratic self-governance, authoritarian control, and election "hacking"; cryptocurrencies; and mass surveillance. This course examines the political challenges wrought by massive increases in the power of computational and communication technologies and the potential for citizens and governments to harness those technologies to solve problems. It is co-taught by one faculty member in computer science and one in political science. No previous programming experience required. Meets with CPSC 310. Students may earn credit for CPSC 210/PLSC 369 or for CPSC 310; not for both. Prerequisite: Internet literacy. SO

CPSC 223a 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 201 or equivalent. QR RP

CPSC 262a / AMTH 262a / S&DS 262a, Computational Tools for Data Science Roy Lederman

Introduction to the core ideas and principles that arise in modern data analysis, bridging statistics and computer science and providing students the tools to grow and adapt as methods and techniques change. Topics include principal component analysis, independent component analysis, dictionary learning, neural networks and optimization, as well as scalable computing for large datasets. Assignments include implementation, data analysis and theory. Students require background in linear algebra, multivariable calculus, probability and programming. Prerequisites: after or concurrently with MATH 222, 225, or 231; after or concurrently with MATH 120, 230, or ENAS 151; after or concurrently with CPSC 100, 112, or ENAS 130; after S&DS 100-108 or S&DS 230 or S&DS 241 or S&DS 242. Enrollment is limited; requires permission of the instructor. QR

CPSC 276b, Introduction to Web Application for the Digital Humanities Holly Rushmeier

Introduction to applications of computer and data science in the humanities, including web technologies, visualization, and database design. Students work in teams to develop a variety of applications proposed by faculty and staff from the Digital Humanities Lab, the Institute for the Preservation of Cultural Heritage, and the Computer Science department. Meets with CPSC 376. Students may earn credit for CPSC 276 or 376; not both. Prerequisite: CPSC 110, CPSC 112, equivalent programming experience, or permission of the instructor. QR

*** CPSC 280a, Directed Reading** Staff

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 290a, Directed Research** Staff

Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. May be taken more than once for credit.

CPSC 310b, Technology, Power, and Security: Political Challenges of the Computer Age Joan Feigenbaum

Twenty-first century societies are faced with both threats and opportunities that combine sophisticated computation with politics and international relations in critical ways. Examples include cyber warfare; cyber espionage; cyber crime; the role of social media in democratic self-governance, authoritarian control, and election "hacking"; cryptocurrencies; and mass surveillance. This course examines the political challenges wrought by massive increases in the power of computational and communication technologies and the potential for citizens and governments to harness those technologies to solve problems. It is co-taught by one faculty member

in computer science and one in political science. Programming experience and some knowledge of basic computer science is required. Meets with CPSC 210/PLSC 369. Students may earn credit for CPSC 210/PLSC 369 or for CPSC 310; not for both. Prerequisite: CPSC 223 or the equivalent. QR, SO

CPSC 323a 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 RP

CPSC 327a 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 334a, 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 338b / EENG 348b, Digital Systems Rajit Manohar

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 365b / ECON 365b, Algorithms Andre Wibisono

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. Either CPSC 365 or CPSC 366 may be taken for credit. Prerequisites: CPSC 202 and 223. QR

*** CPSC 366b / ECON 366b, Intensive Algorithms** Dan Spielman

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. Either CPSC 365 or CPSC 366 may be taken for credit. Prerequisites: MATH 244 and CPSC 223. QR

CPSC 367b / CPSC 467b, Cryptography and Security Staff

An introduction to cryptography and information security. Cryptographic algorithms and their application to security of digital data are presented. Some topics include classical, symmetric, and public key cryptography; digital signatures; cryptographic hash functions; and pseudorandom number generation. Multiparty protocols such as zero-knowledge proofs, secret sharing, anonymous communication, and secure multiparty function evaluation are introduced. Practical applications of cryptography to secure network communication, secure password authentication, and blockchains are also covered. The emphasis is on cryptographic algorithms and protocols that can be useful in providing information security. Students interested in a more mathematical and rigorous approach to these topics should take CPSC 467 instead, or in addition to this course. This course may not be taken for credit after CPSC 467. Prerequisites: Some programming required. After CPSC 202 and 223. QR

CPSC 376b, Advanced Web Application Development in the Digital Humanities

Holly Rushmeier

Advanced applications of computer and data science in the humanities, including web technologies, visualization, and database design. Students work in teams to develop a variety of applications proposed by faculty and staff from the Digital Humanities Lab, the Institute for the Preservation of Cultural Heritage, and the Computer Science department. Meets with CPSC 376. Students may earn credit for CPSC 276 or 376; not both. Prerequisite: CPSC 223 or equivalent, or permission of the instructor. QR

CPSC 413a, 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 422a, Design and Implementation of Operating Systems Zhong Shao

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 425b, Mobile and Embedded Systems Lin Zhong

Mobile and embedded systems are computers that are portable, embedded in a larger system, or both. They are usually resource constrained, intimately interact with

the physical environment, including human users, and often serve mission-critical or privacy-sensitive applications. This course intends to provide a comprehensive introduction to the inner workings of modern mobile and embedded systems, from hardware architecture to operating systems to algorithms. While the lectures focus on theory, principle, and even historical lessons, significant learning of practical systems hacking skills, including learning itself, come from six programming assignments, involving Linux kernel development, FreeRTOS, and baremetal systems. Prerequisite: CPSC 323. SC

CPSC 429a, Principles of Computer System Design Lin Zhong

Humans are stupid; computers are limited. Yet a collaboration of humans and computers has led to ever more powerful and complex computer systems. This course examines the limitations of humans and computers in this endeavor and how they shape the design, implementation, and evaluation of computer systems. It surveys the empirical knowledge reported by scholars and practitioners that overcome such limitations. The lectures, reading assignments, and classroom discussions travel through psychology and philosophy and revisit important results from theoretical computer science, with a goal of elucidating the rationales behind the best practices in computer systems research and development. Prerequisite: CPSC 323 or equivalent. Students should have the ability to write significant system programs in at least one systems programming language (e.g., C, C++ and Rust).

CPSC 431a / MUSI 428a, 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 432b / MUSI 427b, 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 433b, Computer Networks Anurag Khandelwal

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 434a, Topics in Networked Systems** Y. Richard Yang

Study of networked systems such as the Internet and mobile networks which provide the major infrastructure components of an information-based society. Topics include the design principles, implementation, and practical evaluation of such systems in new settings, including cloud computing, software-defined networking, 5G, Internet of things, and vehicular networking. Concurrently with or after CPSC 323. QR

CPSC 437a, Introduction to 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 438a, 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 439b, 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 RP

CPSC 446a, 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. Prerequisite: CPSC 223.

CPSC 448a / EENG 426a / ENAS 876a, Silicon Compilation Rajit Manohar

An upper-level course on compiling computations into digital circuits using asynchronous design techniques. Emphasis is placed on the synthesis of circuits that are robust to uncertainties in gate and wire delays by the process of program transformations. Topics include circuits as concurrent programs, delay-insensitive design techniques, synthesis of circuits from programs, timing analysis and performance optimization, pipelining, and case studies of complex asynchronous designs. Prerequisite: EENG 201 and introductory programming, or permission of instructor.

*** CPSC 449b / EENG 422b, Computer Architectures and Artificial Intelligence**

Richard Lethin

Introduction to the development of computer architectures specialized for cognitive processing, including both offline 'thinking machines' and embedded devices. The

history of machines, from early conceptions in defense systems to contemporary initiatives. Instruction sets, memory systems, parallel processing, analog architectures, probabilistic architectures. Application and algorithm characteristics. Formerly EENG 449. Prerequisites: CPSC 100, CPSC 112, or equivalent programming experience; EENG 325, EENG 348, or equivalent circuits and digital logic experience; or permission of instructor. QR

*** CPSC 451b, 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 452b, 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 453a / NSCI 453a, Unsupervised Learning for Big Data Smita Krishnaswamy

This course focuses on machine-learning methods well-suited to tackling problems associated with analyzing high-dimensional, high-throughput noisy data including: manifold learning, graph signal processing, nonlinear dimensionality reduction, clustering and information theory. Though the class goes over some biomedical applications, such methods can be applied in any field. Prerequisite: Knowledge of linear algebra and Python Programming.

CPSC 454b, Software Analysis and Verification Staff

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 456a / EENG 451a, Wireless Technologies and the Internet of Things**

Wenjun Hu

Over the last two decades or so, consumer IoT technologies have evolved from individual analogous devices, to connected devices and then interconnected networks of devices, from data collection to data management, from smart devices to intelligent interfaces. Wireless connectivity is an important driver of IoT technologies. This course aims to weave together fundamental theory of wireless communications, its application

to IoT, and the design and implementation of wireless network architectures. The concepts are illustrated using examples such as WiFi and LTE/5G. Particular emphasis is placed on the interplay between concepts and their implementation in real systems. The coursework offers a practical experience, built on lab sessions involving WiFi experiments and simple IoT setups, homework involving Matlab-based analysis, and a student-defined course project that can cater to diverse interests. Students can expect to learn background knowledge of some everyday wireless technologies and how to design systems based on the fundamental communications concepts. Given the nature of these invisible signals, students also gain some experience of dealing with uncertainty in experiments and working towards open-ended goals. Depending on the programming background of the students, we may also explore backend system support in the form of edge or cloud computing. Prerequisites: 1) Introductory courses in mathematics, engineering, or computer science covering basics of the following topics: Linux skills, Matlab programming, probability, linear algebra, and Fourier transform; 2) Or by permission of the instructor. Course material will be self-contained as much as possible. The labs and homework assignments require Linux and Matlab skills and simple statistical and matrix analysis (using built-in Matlab functions). There will be a couple of introductory labs to refresh Linux and Matlab skills if needed.

*** CPSC 457a, Sensitive Information in a Connected World** Michael Fischer

Issues of ownership, control, privacy, and accuracy of the huge amount of sensitive information about people and organizations that is collected, stored, and used by today's ubiquitous information systems. Readings consist of research papers that explore both the power and the limitations of existing privacy-enhancing technologies such as encryption and "trusted platforms." After or concurrently with CPSC 365 and 467. QR

CPSC 458b, 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 459a, 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 460a, Automata Theory and Formal Languages Andrew Bridy

Introduction to the theory of automata and formal languages, one of the building blocks of theoretical computer science. Major topics covered are finite automata, pushdown automata, and Turing machines, and their associated languages. Prerequisites: CPSC 201 (or equivalent) and CPSC 365/366/MATH 244 (or equivalent), or permission of instructor. Students should have some familiarity with

formal mathematical argument, including proof techniques such as proof by induction and proof by contradiction. QR

CPSC 463a, Algorithms via Continuous Optimization Nisheeth Vishnoi

Continuous 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 approach is to first formulate the problem as a continuous optimization problem, even if the problem may be 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 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 algorithmic applications include shortest paths, bipartite matching, flows, linear programming, sampling, and counting. We present approaches including gradient descent, mirror descent, multiplicative weights update method, accelerated gradient descent, Riemannian descent, Newton's method, cutting plane methods, Langevin dynamics, and Hamiltonian dynamics. Prerequisites: CPSC 365 or 366 or permission of the instructor. S&DS 430 and a solid background in calculus, linear algebra, probability, and algorithms is recommended. QR

CPSC 467b / CPSC 367b, Cryptography and Computer Security Staff

A survey of such private and public key cryptographic techniques as DES, RSA, and zero-knowledge proofs, and their application to problems of maintaining privacy and security in computer networks. Focus on technology, with consideration of such societal issues as balancing individual privacy concerns against the needs of law enforcement, vulnerability of societal institutions to electronic attack, export regulations and international competitiveness, and development of secure information systems. Some programming may be required. After CPSC 202 and 223. QR

CPSC 470b, Artificial Intelligence Brian Scassellati

Introduction to artificial intelligence research, focusing on reasoning and perception. Topics include knowledge representation, predicate calculus, temporal reasoning, vision, robotics, planning, and learning. After CPSC 201 and 202. QR

CPSC 472a, Intelligent Robotics Brian Scassellati

Introduction to the construction of intelligent, autonomous systems. Sensory-motor coordination and task-based perception. Implementation techniques for behavior selection and arbitration, including behavior-based design, evolutionary design, dynamical systems, and hybrid deliberative-reactive systems. Situated learning and adaptive behavior. After CPSC 201 and 202 or equivalents. May not be taken after CPSC 473. QR

CPSC 474a, 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 475a / BENG 475a / EENG 475a, 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 476b / BENG 476b, Advanced Computational Vision Steven Zucker

Advanced view of vision from a mathematical, computational, and neurophysiological perspective. Emphasis on differential geometry, machine learning, visual psychophysics, and advanced neurophysiology. Topics include perceptual organization, shading, color and texture analysis, and shape description and representation. After CPSC 475. QR, SC

CPSC 477b, Natural Language Processing Staff

Linguistic, mathematical, and computational fundamentals of natural language processing (NLP). Topics include part of speech tagging, Hidden Markov models, syntax and parsing, lexical semantics, compositional semantics, machine translation, text classification, discourse, and dialogue processing. Additional topics such as sentiment analysis, text generation, and deep learning for NLP. Prerequisites: CPSC 202 and CPSC 223, or permission of instructor. QR

CPSC 478b, Computer Graphics Julie Dorsey

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 479a, 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 481a, Introduction to Machine Learning Andre Wibisono

This course provides an introduction to machine learning and the problem of learning from data. It also introduces several frameworks for formulating the learning task as statistical and computational problems, and explores algorithms for solving them. Topics include supervised learning (classification, regression, kernel methods, neural networks), unsupervised learning (clustering, PCA, dimensionality reduction), reinforcement learning (Markov decision process, online learning), and examples of machine learning applications in various domains. This course provides a foundation for students interested in pursuing further research or applications of machine learning. Prerequisites: CPSC 202, MATH 222/225, S&DS 238, MATH 120, familiarity with programming.

* **CPSC 490a, Senior Project** Staff

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 491a, 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)

* **CPAR 491a, Senior Project in Computing and the Arts** Julie Dorsey

Individual research project for majors in Computing and the Arts. Requires two faculty supervisors, one from Computer Science and one from the department in the chosen track. Requires permission of the director of undergraduate studies. The student must present both a verbal and a written report describing the results of the project. May be taken more than once for credit.

Czech (CZEC)

CZEC 110a, Elementary Czech I Karen von Kunes

A comprehensive introduction to Czech for students with no previous knowledge of the language. Essentials of grammar, with emphasis on oral proficiency, reading, writing, and listening comprehension. Online articles, annotated excerpts from Capek's *R. U. R.*, Hasek's *Svejk*, Kundera's *Joke* and *Unbearable Lightness of Being*, and Havel's *Private View*. Audio- and videotapes. L1 RP 1½ Course cr

CZEC 120b, Elementary Czech II Karen von Kunes

Continuation of CZEC 110. After CZEC 110 or equivalent. L2 RP 1½ Course cr

CZEC 130a, Intermediate Czech Karen von Kunes

Continuation of CZEC 120. Grammar and usage, with emphasis on idiomatic expressions, syntax, and stylistics. Readings in modern Czech history, prose, and poetry; discussion of economic, political, and social issues. After CZEC 120 or equivalent. L3 RP 1½ Course cr

CZEC 140b, Advanced Czech Karen von Kunes

Continuation of CZEC 130. Emphasis on writing skills and spoken literary Czech. After CZEC 130 or equivalent. L4 RP 1½ Course cr

* **CZEC 301b / LITR 220b / RSEE 300b, Milan Kundera: The Czech Novelist and French Thinker** Karen von Kunes

Close reading of Kundera's novels, with analysis of his aesthetics and artistic development. Relationships to French, German, and Spanish literatures and to history, philosophy, music, and art. Topics include paradoxes of public and private life, the irrational in erotic behavior, the duality of body and soul, the interplay of imagination and reality, the function of literary metaphor, and the art of composition. Readings and discussion in English. HU TR

The DeVane Lecture Course (DEVN)

View Courses

Directed Studies (DRST)

Dutch (DUTC)

*** DUTC 130a, 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 minjin.hashbat@yale.edu for more information. L3 RP 1½ Course cr

DUTC 140b, 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 minjin.hashbat@yale.edu for more information. L4 RP 1½ Course cr

*** DUTC 150a, 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 minjin.hashbat@yale.edu for more information. L5

*** DUTC 160b, Advanced Dutch II** Staff

Continuation of DUTC 150. 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 150 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. L5

Earth and Planetary Sciences (EPS)

EPS 101a, Climate Change Mary-Louise Timmermans and 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 105b / APHY 100b / ENAS 100b / EVST 100b / PHYS 100b, 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

EPS 110a, Dynamic Earth David Evans

An introduction to the processes that shape Earth's environment through the interactions of rocks, soils, the atmosphere, and the hydrosphere. Field trips and practical sessions in the properties of natural materials. Topics include evolution of landscapes; hydrologic and tectonic cycles; extreme geologic events such as earthquakes, floods, volcanism, and landslides; society's economic dependence on natural materials such as soils, minerals, and fossil fuels; and human influences on the natural environment. SC

EPS 111La, Dynamic Earth Laboratory and Field Methods David Evans

Practical exercises in the laboratory and in the field to complement G&G 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 G&G 110, or after G&G 115. SC ½ Course cr

* **EPS 125b / E&EB 125b, History of Life** Derek Briggs and Pincelli Hull

Examination of fossil and geologic evidence pertaining to the origin, evolution, and history of life on Earth. Emphasis on major events in the history of life, on what the fossil record reveals about the evolutionary process, on the diversity of ancient and living organisms, and on the evolutionary impact of Earth's changing environment. SC

EPS 126Lb, Laboratory for the History of Life Derek Briggs and Pincelli Hull

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 G&G 125. SC ½ Course cr

EPS 211b / EVST 211b / HIST 416b / HSHM 211b, Global Catastrophe since 1750 Bill Rankin

A history of the geological, atmospheric, and environmental sciences, with a focus on predictions of global catastrophe. Topics range from headline catastrophes such as global warming, ozone depletion, and nuclear winter to historical debates about the age of the Earth, the nature of fossils, and the management of natural resources. Tensions between science and religion; the role of science in government; environmental economics; the politics of prediction, modeling, and incomplete evidence. HU

* **EPS 240b, 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 270a, Herpetology** Bhart-Anjan Bhullar

An examination of the origin and evolution of amphibians and reptiles with particular emphasis on global diversity, the fossil record, and the evolution of body plans. Discussion of classic and current literature provides a sense of the state of the art. Detailed hands-on study of external and internal anatomy heavily employs the collections of the Yale Peabody Museum. Observation of animals in the wild is possible during several optional field trips. Prerequisites: BIOL 101-104, high-school AP-equivalent preparation, or permission of instructor. SC

EPS 274a, Fossil Fuels and World Energy Michael Oristaglio

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: G&G 110 or 205. SC

EPS 310a, Isotope Geochemistry Alan Rooney

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: CHEM 115, MATH 120, and PHYS 171 or equivalents, or with permission of instructor. QR, SC

EPS 312a, Structural Geology Mark Brandon

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

EPS 319a, Introduction to the Physics and Chemistry of Earth Materials Shun-ichiro Karato

Basic principles that control the physical and chemical properties of Earth materials. Thermodynamics, equation of state, phase transformations, elastic properties and phase diagrams. After CHEM 161, 165, or 167 (or CHEM 115), MATH 120, and PHYS 181, or equivalents. QR, SC

EPS 322b, 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 181 and MATH 120 or equivalents. QR, SC

EPS 325a, 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 335a, 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 181 and MATH 120 or equivalents, or with permission of instructor. QR, SC

EPS 342a / PHYS 342a, 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 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. Recommended preparation: familiarity with basic calculus and differential equations. QR, SC

*** EPS 345a, 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 125, BIOL 104, or permission of the instructor. SC

EPS 350a, Rock Formation in Mountain Belts Jay Ague

The fundamental principles governing the formation of metamorphic and igneous rocks during mountain building. Topics include processes of heat and mass transfer in orogenic belts, generation of igneous rocks in continental and subduction settings, ultrahigh pressure and ultrahigh temperature metamorphism, spatial and temporal patterns of petrologic processes throughout geologic time, and pressure-temperature-time paths of metamorphic and igneous rocks. Prerequisites: EPS 220 or permission of instructor. SC

EPS 421b, Geophysical Fluid Dynamics Mary-Louise Timmermans

A survey of fluid dynamics, with applications to oceans and atmospheres. Mathematical models illustrate the fundamental dynamical principles of geophysical fluid phenomena such as large-scale flows, waves, boundary layers, and flow stability. Concepts are investigated through laboratory experiments in a rotating water tank. Prerequisites: differential equations and introductory fluid mechanics. QR, SC

EPS 428a / AMTH 428a / E&EB 428a / PHYS 428a, Science of Complex Systems Jun Korenaga

Introduction to the quantitative analysis of systems with many degrees of freedom. Fundamental components in the science of complex systems, including how to simulate complex systems, how to analyze model behaviors, and how to validate models using observations. Topics include cellular automata, bifurcation theory, deterministic chaos, self-organized criticality, renormalization, and inverse theory. Prerequisite: PHYS 301, MATH 247, or equivalent. QR, SC

EPS 456a, Introduction to Seismology Maureen Long

Earthquakes and seismic waves, P and S waves, surface waves and free oscillations. Remote sensing of Earth's deep interior and faulting mechanisms. Prerequisites: MATH 120, 222, and PHYS 181, or equivalents. QR, SC

*** EPS 487a or b, Individual Study in Earth and Planetary Sciences** Staff

Individual study for qualified undergraduates under faculty supervision. To register for this course, each student must submit a written plan of study, approved by the adviser, to the director of undergraduate studies. May be taken more than once for credit. ½ Course cr

*** EPS 488a and EPS 489b, Research in Earth and Planetary Sciences** Staff

Individual study for qualified juniors and seniors under faculty supervision. To register for this course, each student must submit a written plan of study, approved by the adviser, to the director of undergraduate studies.

*** EPS 490a and EPS 491b, Research and Senior Thesis** Staff

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 492a or b, The Senior Essay** Staff

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 040b, The Great Cities of Ancient China** Pauline Lin

What constitutes a city? What are some of the cultural beliefs, social and economic structures, and technological capacities that influenced early Chinese urban designs?

How does a dense gathering of people reshape social hierarchy? How is urban life represented in texts, image and material culture? Focusing on Chinese sites from the Neolithic to the 12th century, using textual, archaeological, and visual sources, this course explores the changing nature of urban centers and its relationship to human inhabitants. Topics include: urban revolution and the emergence of elites; art and authority; the cosmological capital of Qin Xianyang; a walk through 6th century Luoyang; foreign merchants in the Tang; and commerce and the street. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

EALL 200a / CHNS 200a / EAST 240a / HUMS 270a, The Chinese Tradition Tina Lu

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 TR

EALL 219b / RLST 171, Introduction to Chinese Philosophy Lucas Bender and Eric Greene

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

* **EALL 221a / RLST 486a, Introduction to Chinese Buddhist Literature** Eric Greene

This class is an introduction to Chinese Buddhist literature. Although written in classical Chinese, Buddhist texts in China were written in a particular idiom that was much influenced by the Indian languages and which can be difficult to understand without special training. This class introduces students who already have some reading ability in literary Chinese to this idiom and the tools and background knowledge needed to read and understand Chinese Buddhist literature. We read a series of selections of some of the most influential Chinese Buddhist texts from various genres including canonical scriptures, apocryphal scriptures, monastic law, doctrinal treatises, and hagiography. Secondary readings introduce the basic ideas of Indian and Chinese Buddhist thought to the extent necessary for understanding our readings. Prerequisite: CHNS 171 (Literary Chinese II) or equivalent, or permission of the instructor. Students of Japanese or Korean literature who can read basic *kanbun* or *gugyeol* are also welcome to enroll; no knowledge of modern, spoken Chinese is required. L5, HU

* **EALL 236a / LITR 181a, Japanese Poetry and Poetics** Edward Kamens

Core concepts and traditions of classical Japanese poetry explored through the medium of translation. Readings from anthologies and treatises of the ninth through early twentieth centuries. Attention to recent critical studies in transcultural poetic theory. Inspection and discussion of related artifacts in the Beinecke Rare Book and Manuscript Library and the Yale University Art Gallery. Readings and discussion in English. No knowledge of Japanese required. Previous study of literary texts is recommended but not required. WR, HU

* **EALL 262b, Natsume Sōseki** Timothy Goddard

This seminar explores the oeuvre of Natsume Sōseki (1867–1916), the preeminent writer of modern Japan. Readings include a broad sampling of Sōseki's fiction from across his career, as well as selected poems and essays. Discussions situate Sōseki's writings in the context of Japan's rapid modernization and imperial expansion during the Meiji period (1868–1912), and considers Sōseki's enduring legacy in the Japanese literary canon and as a figure of world literature. All readings are in English translation; no knowledge of Japanese is required. HU

* **EALL 265b / EAST 253b / LITR 251b, Japanese Literature after 1970** Timothy Goddard

This course provides a survey of Japanese literature from 1970 to the present. Readings include novels and essays from a diverse range of authors, addressing themes such as identity, language, memory, domesticity, postmodernism, and racial discrimination.

Students develop extensive knowledge of contemporary Japanese literature, while also cultivating skills in close reading and research methods. All readings are in English translation; no knowledge of Japanese is required. HU

* **EALL 268b, The Literature of Japanese Empire** Timothy Goddard

Spanning a period from the 1910s to the 1940s, this course considers the effects of Japanese imperialism on the development of modern literature in East Asia. How did authors from mainland Japan represent the so-called outer territories of the empire? How did authors from colonial Taiwan and Korea navigate issues of language, identity, and culture in their writings? What significance did the semi-colonial city of Shanghai hold in the modern literary imagination? Readings include a broad range of primary sources, including novels, short stories, essays, poems, and travelogues. We also engage with selections from recent secondary sources to understand how scholars have approached this tumultuous era in East Asian literary history. Knowledge of Japanese, Chinese, and Korean is not required, though students with reading ability in any of these languages will have opportunities to practice them. HU

* **EALL 273a, Postwar Japanese Literature, 1945–1970** Timothy Goddard

Spanning a period from 1945 to 1970, this course provides an introduction to Japanese literature after Japan's catastrophic defeat in the Asia-Pacific War. Readings include novels, essays, and poetry by major writers of the era, including Dazai Osamu, Enchi Fumiko, Kawabata Yasunari, Mishima Yukio, and Tanizaki Jun'ichirō. In our discussions, we consider how Japanese writers responded to this moment of profound crisis, exploring such themes as identity, memory, modernity, and the nation. All readings are in English translation; no knowledge of Japanese is required. HU

* **EALL 281a / FILM 304a, Japanese Cinema and Its Others** Aaron Gerow

Critical inquiry into the myth of a homogeneous Japan through analysis of how Japanese film and media historically represents “others” of different races, ethnicities, nationalities, genders, and sexualities, including women, black residents, ethnic Koreans, Okinawans, Ainu, undocumented immigrants, LGBTQ minorities, the disabled, youth, and monstrous others like ghosts. HU

* **EALL 290a / EAST 402a / FILM 422a, Screening China from the Margins** Staff

This seminar challenges mainstream understandings of contemporary China by focusing on films concerned with the people who exist on its margins. The course is divided into three units: sexuality, socio-economic inequality, and ethnicity. Students are introduced to the terms of film analysis and of contemporary Chinese history and social issues. Films are drawn from China, Hong Kong, and Taiwan, and represent both major studio directors, such as Wang Kar-wai and Ang Lee, and independent directors, such as Pema Tsenden and Jia Zhangke. Students have the option of creating short videos/films in lieu of certain written assignments. All films and readings are available in English. No previous knowledge of Chinese language or culture is required. HU

* **EALL 296a / EAST 391a / RLST 121a, Religion and Culture in Korea** Hwansoo Kim

Introduction to Shamanism, Buddhism, Confucianism, Daoism, Christianity, and new religions in Korea from ancient times to the present. Examination of religious traditions in close relationships with social, economic, political, and cultural environments in Korean society. Examination of religious tensions, philosophical arguments, and ethical

issues that indigenous and foreign religions in Korea have engaged throughout history to maximize their influence in Korean society. HU

* **EALL 300a / EAST 340a, Sinological Methods** Pauline Lin

A research course in Chinese studies, designed for students with background in modern and literary Chinese. Explore and evaluate the wealth of primary sources and research tools available in China and in the West. For native speakers of Chinese, introduction to the secondary literature in English and instruction in writing professionally in English on topics about China. Topics include Chinese bibliographies; bibliophiles' notes; specialized dictionaries; maps and geographical gazetteers; textual editions, variations and reliability of texts; genealogies and biographical sources; archaeological and visual materials; and major Chinese encyclopedias, compendia, and databases. Prerequisite: CHNS 171 or equivalent. Formerly CHNS 202. HU

* **EALL 301a, Ancient and Medieval Chinese Poetry** Lucas Bender

Readings in ancient and middle-period Chinese poetry, from the beginnings of the tradition through the Song dynasty. Prerequisite: one year of classical/literary Chinese or equivalent, or permission of the instructor. HU

EALL 308b, Sages of the Ancient World Mick Hunter

Comparative survey of ancient discourses about wisdom from China, India, the Near East, Egypt, Greece, and Rome. Topics include teaching, scheming, and dying. HU

* **EALL 321b / EAST 401b / THST 367b, Theater and Drama Traditions of China and Japan** Staff

This seminar offers a window into Chinese and Japanese drama and theater traditions from their beginnings to the 20th century. We engage issues of dramatic texts as well as performance practices; thus, the course draws on material from theater history, performance and acting conventions, and the literary history of drama. Readings and discussions span major genres of dramatic writing and their different modes of performance, including the Chinese dramatic genres of zaju and chuanqi; Chinese performance styles of Beijing opera and Kunqu; and Japanese dramatic genres and performance practices of noh, kyogen, kabuki, and puppet theater. Throughout the course, we engage closely with dramatic texts as literature, giving detailed thematic readings to some canonical and non-canonical plays. We also consider how dramatic writing and theatrical performance relate to broader trends in sociopolitical history and literary history, exploring how dramatic texts and theatrical performance embody a multivalent and multisensory space that is unique among creative enterprises. We deal with both the actor and the text, and consider how each are conditioned by modern and premodern contexts. No prerequisites are required, although some prior knowledge of China or Japan is helpful. HU

East Asian Studies (EAST)

* **EAST 030b / HIST 030b, Tokyo** Daniel Botsman

Four centuries of Japan's history explored through the many incarnations, destructions, and rebirths of its foremost city. Focus on the solutions found by Tokyo's residents to the material and social challenges of concentrating such a large population in one place. Tensions between continuity and impermanence, authenticity and modernity, and social order and the culture of play. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

EAST 220a / HIST 321a, China from Present to Past, 2021–960 Valerie Hansen
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. WR, HU

EAST 240a / CHNS 200a / EALL 200a / HUMS 270a, The Chinese Tradition Tina Lu
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

* **EAST 253b / EALL 265b / LITR 251b, Japanese Literature after 1970** Timothy Goddard

This course provides a survey of Japanese literature from 1970 to the present. Readings include novels and essays from a diverse range of authors, addressing themes such as identity, language, memory, domesticity, postmodernism, and racial discrimination. Students develop extensive knowledge of contemporary Japanese literature, while also cultivating skills in close reading and research methods. All readings are in English translation; no knowledge of Japanese is required. HU

EAST 301a / HIST 307a, The Making of Japan's Great Peace, 1550–1850 Fabian Drixler

Examination of how, after centuries of war in Japan and overseas, the Tokugawa shogunate built a peace that lasted more than 200 years. Japan's urban revolution, the eradication of Christianity, the Japanese discovery of Europe, and the question of whether Tokugawa Japan is a rare example of a complex and populous society that achieved ecological sustainability. HU

* **EAST 303a / HIST 303Ja, Hong Kong and China: A Cross-Border History** Denise Ho

This departmental seminar studies the historical development of Hong Kong and China in relation to each other, from the colonial and late imperial experience to their shared histories in national and political movements, from postwar industrialization to reform-era economic growth, culminating in the 1997 handover and its attendant political and economic integration. The readings from the first half of the semester come primarily from the literature in history, while the readings in the second half draw from anthropology, economics, political science, and sociology. Each week readings include primary sources in or translated into English. WR, HU

* **EAST 309b / HIST 309Jb, Uses of the Past in Modern China** Denise Ho

Modern China's use of the past in state-sponsored narratives of nation, in attempts to construct heritage by elites and intellectuals, and in grassroots projects of remembrance. Theories on history and memory; primary sources in English translation; case studies from twentieth-century China. Interdisciplinary readings in art history, anthropology, cultural studies, and history. WR, HU

EAST 310b / GLOBL 309b / PLSC 357b, The Rise of China Daniel Mattingly

Analysis of Chinese domestic and foreign politics, with a focus on the country's rise as a major political and economic power. Topics include China's recent history, government, ruling party, technology, trade, military, diplomacy, and foreign policy. SO

*** EAST 319b / HIST 319Jb, Tokugawa Japan and the Human Condition** Fabian Drixler

An exploration of what Tokugawa Japan can teach us about shared human challenges and the diverse solutions different societies have found for them. Topics include standards of physical beauty; loyalty; romantic love; naming and the power of words; animals, infants, and the boundaries of humanity; unspeakable truths and open secrets; concealed power and the power of concealment; permissible violence; acceptable disasters; and the relationship of the living with the dead. In their coursework, students are invited to draw on their knowledge of other times and places as they put Tokugawa Japan in comparative perspective. HU

*** EAST 340a / EALL 300a, Sinological Methods** Pauline Lin

A research course in Chinese studies, designed for students with background in modern and literary Chinese. Explore and evaluate the wealth of primary sources and research tools available in China and in the West. For native speakers of Chinese, introduction to the secondary literature in English and instruction in writing professionally in English on topics about China. Topics include Chinese bibliographies; bibliophiles' notes; specialized dictionaries; maps and geographical gazetteers; textual editions, variations and reliability of texts; genealogies and biographical sources; archaeological and visual materials; and major Chinese encyclopedias, compendia, and databases. Prerequisite: CHNS 171 or equivalent. Formerly CHNS 202. HU

EAST 375b / HIST 375b, China from Mao to Now Denise Ho

The history of the People's Republic of China from Mao to now, with a focus on understanding the recent Chinese past and framing contemporary events in China in historical context. How the party-state is organized; interactions between state and society; causes and consequences of economic disparities; ways in which various groups – from intellectuals to religious believers – have shaped the meaning of contemporary Chinese society. HU

*** EAST 391a / EALL 296a / RLST 121a, Religion and Culture in Korea** Hwansoo Kim

Introduction to Shamanism, Buddhism, Confucianism, Daoism, Christianity, and new religions in Korea from ancient times to the present. Examination of religious traditions in close relationships with social, economic, political, and cultural environments in Korean society. Examination of religious tensions, philosophical arguments, and ethical issues that indigenous and foreign religions in Korea have engaged throughout history to maximize their influence in Korean society. HU

*** EAST 401b / EALL 321b / THST 367b, Theater and Drama Traditions of China and Japan** Staff

This seminar offers a window into Chinese and Japanese drama and theater traditions from their beginnings to the 20th century. We engage issues of dramatic texts as well as performance practices; thus, the course draws on material from theater history, performance and acting conventions, and the literary history of drama. Readings and discussions span major genres of dramatic writing and their different modes of performance, including the Chinese dramatic genres of zaju and chuanqi; Chinese

performance styles of Beijing opera and Kunqu; and Japanese dramatic genres and performance practices of noh, kyogen, kabuki, and puppet theater. Throughout the course, we engage closely with dramatic texts as literature, giving detailed thematic readings to some canonical and non-canonical plays. We also consider how dramatic writing and theatrical performance relate to broader trends in sociopolitical history and literary history, exploring how dramatic texts and theatrical performance embody a multivalent and multisensory space that is unique among creative enterprises. We deal with both the actor and the text, and consider how each are conditioned by modern and premodern contexts. No prerequisites are required, although some prior knowledge of China or Japan is helpful. HU

* **EAST 402a / EALL 290a / FILM 422a, Screening China from the Margins** Staff
 This seminar challenges mainstream understandings of contemporary China by focusing on films concerned with the people who exist on its margins. The course is divided into three units: sexuality, socio-economic inequality, and ethnicity. Students are introduced to the terms of film analysis and of contemporary Chinese history and social issues. Films are drawn from China, Hong Kong, and Taiwan, and represent both major studio directors, such as Wang Kar-wai and Ang Lee, and independent directors, such as Pema Tseden and Jia Zhangke. Students have the option of creating short videos/films in lieu of certain written assignments. All films and readings are available in English. No previous knowledge of Chinese language or culture is required. HU

* **EAST 403b / HIST 315Jb, Japan and Germany, 1860 to the Present** Staff
 This course examines the histories of Japan and Germany from the founding of the two as modern nation states through the present. Relatively latecomers compared to supposedly “normal” nation states like the United States, France, and the United Kingdom, both societies followed similar, sometimes connected paths. The course introduces students to connections between East Asia and Europe through the nineteenth and twentieth centuries and explores how the specific parallels and entanglements between Japan and Germany shaped the histories of both regions. The course emphasizes themes of race, gender, and empire. Students engage with texts in history, sociology, and anthropology to answer key questions about Japanese and German history with particular emphasis on the question: is there something “peculiar” about their histories that led them to similar outcomes? HU

* **EAST 404a / HIST 305Ja / RLST 359a, Faith in Law in East Asia: Beginnings to 1800** Staff
 This course investigates law in East Asia from ancient times to 1800 from the perspective of belief. We debate treatises, codes, cases, and cultural products from across East Asia’s legal traditions, tracing the lives they took on. We work to understand firsthand law in its diverse contexts. More fundamentally, we consider the many ways in which people formed beliefs about what “law” might be or do. We examine the philosophical and faith traditions – and the hopes and fears – through which law was articulated, justified, realized, and then immediately contested. Throughout, we ask: What does it mean to invest law with one’s faith? How much of one’s belief is law? How much does law depend on one’s belief? What gave people pause about this over time? You develop your own answers, with an eye toward how all of this has been understood, misunderstood, and appropriated across cultures and time. So the next time you hear an analyst or government official explain something in East Asia as

rooted in “a Confucian disdain for law,” or “Japanese ‘Justice,’” (feat. in NYT) you will be equipped to strike up a conversation about just how they arrived at that belief. HU

*** EAST 405a / HIST 317Ja, Japanese History before 1600: Society and Economy** Staff

This seminar employs a topical approach to the social and economic history of Japan between about 800 and 1600. We begin with the roles of each social group, from emperor to outcast, and then explore critical issues including: disease and famine; the varied roles of women; cities and commerce; the human relationship to the environment; legal and extralegal crime and punishment; and contacts with Korea and China. HU

*** EAST 406a / EAST 506a / RLST 225a / RLST 628a, Paradise in Buddhism: Pure Land Traditions** Staff

Pure Land Buddhism is a tradition with roots in India that developed most extensively in East Asia. Unlike other forms of Buddhism, it centers on a paradise motif and is largely devotional in character. It arises from scriptural stories about a transcendent Buddha named Amida who vows to bring all living beings to enlightenment via an other-worldly realm known as the Pure Land. The seminar examines this tradition historically against the backdrop of Buddhism in general, focusing on the Pure Land sutras and the unfolding of Pure Land Buddhism in Japan. Among the goals of the course is to develop familiarity with the structure of the sutras and with classical Buddhology, the core concepts and strategies of Buddhist doctrine and story-making. It also explores the teachings of several celebrated Japanese Buddhists, the portrayal of women in texts and religious practices, and the demythologization of Pure Land and Amida in the modern period. HU

*** EAST 412b / RLST 417, Mummies, Ghost, and Relics: Understandings of the Sacred Dead** Staff

The objective of this course is to examine how Buddhist cultures perceive of death – conceptually and physically through corpses, mummies, ghosts, and relics – using secondary scholarship in English on Buddhist sutras, popular stories, oral traditions, and material objects. The readings, which span across China, India, Japan, and Taiwan, show that there is great variance in how the bodies of the dead, whole or fragmented, are enshrined, worshipped, and written about. There are distinct parallels, as well. This course teaches students about Buddhist practices in which the body is preserved and enshrined, in part or whole; it addresses issues of gender and the body, ritual killing of the dead, theft of corpses, and other thought-provoking topics related to the sacred dead. This course is designed to answer questions, such as: What can we learn from the skeletons of the past that is not always present in books? Why would monks go to such lengths to preserve the dried body of a fellow monk? Why would some monks knowingly starve themselves? What makes someone a buddha? Can a female become a buddha? And, what happens to the souls of young children and fetuses in the afterworld? HU

*** EAST 413a / HIST 381Ja, Writing the Rise and Fall of the Qin Empire** Staff

This course is a survey of the history of the Qin empire from its pre-imperial origins to its fall in 207 BCE – with a twist. We learn about the Qin, but we also use the Qin as a case study for the writing of East Asian history. How do we know what we know about the past? What assumptions are we making when we read a primary document? What’s the difference between primary and secondary sources? Instead of beginning with survey materials written by scholars, we start with so-called primary sources

(in translation). We then look at excavated materials. With new materials coming to light nearly every month, the study of the Qin empire is an exciting and quickly changing field of study. There is likely to be new evidence published during the course of the semester. HU TR

*** EAST 416b / HIST 386Jb, Childhood and Domesticity in East Asia** Staff

This course offers an overview of burgeoning studies of childhood and domesticity in East Asia to get us to think about childhood and domesticity as methodologies of studying East Asia and history in general. Instead of learning about children “as they were,” this course examines how childhood and domesticity were socially constructed. East Asia is our geographical focus, although this course also introduces students to relevant key works in studies of childhood in the United States and Europe. This course focuses on several key questions. How do studies of childhood and domesticity enhance, challenge, and/or broaden our understanding of East Asia? How were normative conceptions of childhood, domesticity, and family constructed and challenged throughout the 20th century? How does scholarship on childhood and domesticity help us understand our own experiences of childhood, family, and homes? How can we make connections between the familiar/mundane everyday life with more explicitly political issues, such as wars and economy? Through a transnational approach, we situate East Asia within the global, transnational circulation of ideas, people, money, and practices that continue to shape how we perceive and experience our childhood, family, and domesticity. HU

*** EAST 417a / ANTH 414a, Hubs, Mobilities, and World Cities** Helen Siu

Analysis of urban life in historical and contemporary societies. Topics include capitalist and postmodern transformations; class, gender, ethnicity, and migration; and global landscapes of power and citizenship. SO RP

*** EAST 418b / EAST 218, Chinese Media and Popular Culture** Staff

This course aims to examine stories we tell ourselves about China. How do popular fictions, films, search engines, and social media shape the concept of China? What are the social, technological, political, and economic contexts of Chinese media and communication systems? Why do the U. S. media produce either a “sunshine” or a “noir” version of the Chinese state? How do international politics influence the transnational circulation of cultural products from China? As a broad, accessible course on contemporary China (1979-), this course introduces salient themes in the studies of the political economy of Chinese popular culture. HU

*** EAST 431b / RLST 175b, North Korea and Religion** Hwansoo Kim

Ever since the establishment of the Democratic People’s Republic of Korea (DPRK) in 1948 and the Korean War (1950–1953), North Korea has been depicted by the media as a reclusive, oppressive, and military country, its leaders as the worst dictators, and its people as brainwashed, tortured, and starving to death. The still ongoing Cold War discourse, intensified by the North Korea’s recent secret nuclear weapons program, furthers these negative images, and outsiders have passively internalized these images. However, these simplistic characterizations prevent one from gaining a balanced understanding of and insight into North Korea and its people on the ground. Topics other than political, military, and security issues are rarely given attention. On the whole, even though North Korea’s land area is larger than South Korea and its population of 25 million accounts for a third of all Koreans, North Korea has been neglected in the scholarly discussion of Korean culture. This class tries to make sense

of North Korea in a more comprehensive way by integrating the political and economic with social, cultural, and religious dimensions. In order to accomplish this objective, students examine leadership, religious (especially cultic) aspects of the North Korean Juche ideology, the daily lives of its citizens, religious traditions, the Korean War, nuclear development and missiles, North Korean defectors and refugees, human rights, Christian missionary organizations, and unification, among others. Throughout, the course places North Korean issues in the East Asian and global context. The course draws upon recent scholarly books, articles, journals, interviews with North Korean defectors, travelogues, media publications, and visual materials. so

*** EAST 470a or b, Independent Study** Staff

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 480a or b, One-Term Senior Essay Staff

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 491a and EAST 492b, Senior Research Project** Staff

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)

*** E&EB 106a / HLTH 155a / MCDB 106a, 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 freshmen and sophomores. Prerequisite: high school biology. sc

*** E&EB 125b / EPS 125b, History of Life** Pincelli Hull and Derek Briggs

Examination of fossil and geologic evidence pertaining to the origin, evolution, and history of life on Earth. Emphasis on major events in the history of life, on what the fossil record reveals about the evolutionary process, on the diversity of ancient and living organisms, and on the evolutionary impact of Earth's changing environment. sc

E&EB 210a / S&DS 101a, Introduction to Statistics: Life Sciences Jonathan Reuning-Scherer and Walter Jetz

Statistical and probabilistic analysis of biological problems, presented with a unified foundation in basic statistical theory. Problems are drawn from genetics, ecology, epidemiology, and bioinformatics. QR

E&EB 220a / EVST 223a, General Ecology David Vasseur and Carla Staver

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

E&EB 223Lb, Laboratory for Principles of Ecology, Evolutionary Biology, and the Tree of Life Marta Wells

Study of evolutionary novelties, their functional morphology, and their role in the diversity of life. Introduction to techniques used for studying the diversity of animal body plans. Evolutionary innovations that have allowed groups of organisms to increase their diversity. SC ½ Course cr

E&EB 225b, Evolutionary Biology Alvaro Sanchez

An overview of evolutionary biology as the discipline uniting all of the life sciences. Reading and discussion of scientific papers to explore the dynamic aspects of evolutionary biology. Principles of population genetics, paleontology, and systematics; application of evolutionary thinking in disciplines such as developmental biology, ecology, microbiology, molecular biology, and human medicine. SC

E&EB 228b, Ecology and Evolution of Infectious Diseases Paul Turner

Overview of the ecology and evolution of pathogens (bacteria, viruses, protozoa) and their impact on host populations. Topics include theoretical concepts, ecological and evolutionary dynamics, molecular biology, and epidemiology of ancient and emerging diseases. Prerequisite: BIOL 104 or permission of instructor. SC

* **E&EB 238a, Research in Viral Genomics** Staff

This research-based course provides an introduction to genomics research in microbiology, with a hybrid approach involving lab exercises, mentored research, and active-learning based lectures. This course helps students determine if they are interested in undergraduate research in a research lab on campus. The overall scientific goal of the course is to teach the background knowledge necessary to determine the locations and predicted functions of all genes in a newly characterized viral genome, which is done with the accompanying lab, E&EB 239L. The lecture and lab must be taken concurrently. Space is limited and students must submit an application. No previous research experience is necessary. Contact instructor with questions. Prerequisites: BIOL 101 and 102. SC

* **E&EB 239La, Research in Viral Genomics Laboratory** Staff

This research-based laboratory provides an introductory experience with genomics research in microbiology and helps students determine if they are interested in undergraduate research in a research lab on campus. The overall scientific goal is to determine the locations and predicted functions of all genes in a newly characterized viral genome, with the potential outcome of publishing results as a peer-reviewed scientific manuscript. This lab must be taken concurrently with E&EB 238. Space is

limited and students must submit an application. No previous research experience is necessary. Contact instructor with questions. Prerequisites: BIOL 101 and 102. SC
½ Course cr

E&EB 246a, Plant Diversity and Evolution Erika Edwards

This course has several, interrelated objectives. First, it serves as an introduction to the science of phylogenetics, providing an overview of both the theory and methodology involved in constructing phylogenetic trees, and how to use trees to study character and organismal evolution. For our second objective, we put this new framework to immediate use by using phylogeny to explore and illustrate 400 million years of land plant evolution, with emphasis on the diversity of flowering plants. The course examines major trends in plant evolution from functional, ecological, and biogeographical perspectives. Students acquire a basic understanding of 1) phylogenetic approaches to comparative biology, 2) plant anatomy and morphology, 3) evolutionary relationships among the major land plant clades (with emphasis on the flowering plants), and 4) major evolutionary trends that have significantly shaped the diversity of plant life that we see today. The third and most important objective is to instill in students the ability to look at any biological problem through the lens of "phylogeny-colored glasses"- a powerful way to examine the complexity of life that surrounds (and includes!) us. Prerequisite: BIOL 104. SC

E&EB 247La, Laboratory for Plant Diversity and Evolution Erika Edwards

Hands-on experience with the plant groups examined in the accompanying lectures. Local field trips. To be taken concurrently with E&EB 246. SC ½ Course cr

E&EB 250a, Biology of Terrestrial Arthropods Marta Wells

Evolutionary history and diversity of terrestrial arthropods (body plan, phylogenetic relationships, fossil record); physiology and functional morphology (water relations, thermoregulation, energetics of flying and singing); reproduction (biology of reproduction, life cycles, metamorphosis, parental care); behavior (migration, communication, mating systems, evolution of sociality); ecology (parasitism, mutualism, predator-prey interactions, competition, plant-insect interactions). To be taken concurrently with E&EB 251L. SC

E&EB 251La, Laboratory for Biology of Terrestrial Arthropods Marta Wells

Comparative anatomy, dissections, identification, and classification of terrestrial arthropods; specimen collection; field trips. Concurrently with or after E&EB 250. SC
½ Course cr

E&EB 255a, Invertebrates Casey Dunn

An overview of animal diversity that explores themes including animal phylogenetics (evolutionary relationships), comparative studies of evolutionary patterns across species, organism structure and function, and the interaction of organisms with their environments. Most animal lineages are marine invertebrates, so marine invertebrates are the focus of most of the course. E&EB 256L is not required to enroll in the lecture. SC

E&EB 256La, Laboratory for Invertebrates Casey Dunn

The study of invertebrate anatomy and diversity in a laboratory and field setting. Activities will include will examine live animals and museum specimens, as well as local field trips. Some field trips will fall on weekends. This lab must be taken concurrently with the lecture E&EB 255. SC ½ Course cr

E&EB 290b, Comparative Developmental Anatomy of Vertebrates Staff

A survey of the development, structure, and evolution of major vertebrate groups. Topics include the micro-anatomy of major organ systems, the developmental underpinnings of the vertebrate body plan, and the development, structure, and evolution of the major organ systems such as the locomotory system, sensory organs, digestive tract, reproductive tract, and nervous system. SC

E&EB 291Lb, Comparative Anatomy of Vertebrates Laboratory Staff

Microscopic examination of histological and embryological preparations. Dissection of selected vertebrate species including shark, bony fish, frog, lizard, and rat. To be taken with E&EB 290. SC ½ Course cr

*** E&EB 335a / HLTH 250a, Evolution and Medicine** Brandon Ogbunu

Introduction to the ways in which evolutionary science informs medical research and clinical practice. Diseases of civilization and their relation to humans' evolutionary past; the evolution of human defense mechanisms; antibiotic resistance and virulence in pathogens; cancer as an evolutionary process. Students view course lectures on line; class time focuses on discussion of lecture topics and research papers. Prerequisite: BIOL 101-104. WR, SC

*** E&EB 342a / ANTH 335a, Primate Diversity and Evolution** Eric Sargis

The diversity and evolutionary history of living and extinct primates. Focus on major controversies in primate systematics and evolution, including the origins and relationships of several groups. Consideration of both morphological and molecular studies. Morphological diversity and adaptations explored through museum specimens and fossil casts. Recommended preparation: ANTH 116 or BIOL 104. SC

E&EB 428a / AMTH 428a / EPS 428a / PHYS 428a, Science of Complex Systems Jun Korenaga

Introduction to the quantitative analysis of systems with many degrees of freedom. Fundamental components in the science of complex systems, including how to simulate complex systems, how to analyze model behaviors, and how to validate models using observations. Topics include cellular automata, bifurcation theory, deterministic chaos, self-organized criticality, renormalization, and inverse theory. Prerequisite: PHYS 301, MATH 247, or equivalent. QR, SC

E&EB 464a / ANTH 464a / ARCG 464a, 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

*** E&EB 469a or b, Tutorial** Marta Wells

Individual or small-group study for qualified students who wish to investigate an area of ecology or evolutionary biology not presently covered by regular courses. A student must be sponsored by a faculty member who sets requirements and meets weekly with the student. One or more written examinations and/or a term paper are required. To register, the student must submit a written plan of study approved by the faculty instructor to the director of undergraduate studies. Students are encouraged to apply during the term preceding the tutorial. Proposals must be submitted no later than the first day of the second week of the term in which the student enrolls in the tutorial.

The final paper is due in the hands of the director of undergraduate studies by the last day of reading period in the term of enrollment. 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 be counted as an elective toward the requirements of the major. Normally, faculty sponsors must be members of the EEB department.

*** E&EB 470a or b, Senior Tutorial** Marta Wells

Tutorial for seniors in the B.A. degree program who elect a term of independent study to complete the senior requirement. A thesis, fifteen to twenty pages in length, is required. A student must be sponsored by a faculty member who sets requirements and meets weekly with the student. To register, the student must submit a written plan of study approved by the faculty instructor to the director of undergraduate studies. Students are encouraged to apply during the term preceding the tutorial. Proposals must be submitted no later than the first day of the second week of the term in which the student enrolls in the tutorial. The final paper is due in the hands of the director of undergraduate studies by the last day of reading period in the term of enrollment. Normally, faculty sponsors must be members of the EEB department. Enrollment limited to seniors. Fulfills the senior requirement for the B.A. degree.

*** E&EB 474a or b, Research** Marta Wells

One term of original research in an area relevant to ecology or evolutionary biology. This may involve, for example, laboratory work, fieldwork, or mathematical or computer modeling. Students may also work in areas related to environmental biology such as policy, economics, or ethics. The research project may not be a review of relevant literature but must be original. In all cases students must have a faculty sponsor who oversees the research and is responsible for the rigor of the project. Students are expected to spend ten hours per week on their research projects. Using the form available from the office of undergraduate studies or from the Canvas, students must submit a research proposal that has been approved by the faculty sponsor to the director of undergraduate studies, preferably during the term preceding the research. Proposals are due no later than the first day of the second week of the term in which the student enrolls in the course. The final research paper is due in the hands of the director of undergraduate studies by the last day of reading period in the term of enrollment.

*** E&EB 475a and E&EB 476b, Senior Research** Marta Wells

One term of original research in an area relevant to ecology or evolutionary biology. This may involve, for example, laboratory work, fieldwork, or mathematical or computer modeling. Students may also work in areas related to environmental biology such as policy, economics, or ethics. The research project may not be a review of relevant literature but must be original. In all cases students must have a faculty sponsor who oversees the research and is responsible for the rigor of the project. Students are expected to spend ten hours per week on their research projects. Using the form available from the office of undergraduate studies or from the Canvas, students must submit a research proposal that has been approved by the faculty sponsor to the director of undergraduate studies, preferably during the term preceding the research. Proposals are due no later than the first day of the second week of the term in which the student enrolls in the course. The final research paper is due in the hands of the director of undergraduate studies by the last day of classes in the term of enrollment. Fulfills the senior requirement for the B.S. degree. Enrollment limited to seniors.

* **E&EB 495a and E&EB 496b, Intensive Senior Research** Marta Wells

One term of intensive original research during the senior year under the sponsorship of a Yale faculty member. Similar to other research courses except that a more substantial portion of a student's time and effort should be spent on the research project (a minimum average of twenty hours per week). A research proposal approved by the sponsoring faculty member must be submitted to the director of undergraduate studies; forms are available from the office of undergraduate studies. For research in the fall term, approval is encouraged during the spring term of the junior year. Proposals are due no later than the first day of the second week of the term in which the student enrolls in the course. The final research paper is due in the hands of the director of undergraduate studies by the last day of reading period in the term of enrollment. One term of intensive research fulfills a portion of the senior requirement for the B.S. degree. 2 Course cr per term

Economics (ECON)

* **ECON 001b, Economic Ideas Worth a Nobel Prize** Jose-Antonio Espin-Sanchez

This course introduces students to a selection of ideas that in the past fifty years have merited a Nobel Prize in economics. The goal of the course is twofold. First, it serves as an introduction to a wide range of economic topics. Second, by studying the most influential economic ideas, students learn firsthand how economic science has evolved. The course is not structured chronologically, but according to economic areas, such as microeconomics, macroeconomics, finance, poverty, and the environment. No prior knowledge of economics or statistics is assumed. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. SO

* **ECON 002b, 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. Preregistration required; see under First-Year Seminar Program. SO

* **ECON 108a, 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. Online preregistration is required; visit economics.yale.edu/undergraduate-program for more information. May not be taken after ECON 110 or 115. QR, SO

* **ECON 110a 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. Online preregistration is required; visit economics.yale.edu/undergraduate-program for more information. May not be taken after ECON 108 or 115. QR, SO

* **ECON 111a or b, An Introduction to Macroeconomic Analysis** Staff

Similar to ECON 116, but taught as a lecture discussion with limited enrollment. Enrollment limited to first-years and sophomores. Online preregistration is required;

visit economics.yale.edu/undergraduate-program for more information. May not be taken after ECON 116. Prerequisite: ECON 108, 110, or 115. SO

ECON 115a 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

ECON 116a or b, Introductory Macroeconomics Staff

An introduction that stresses how the macroeconomy works, including the determination of output, unemployment, inflation, interest rates, and exchange rates. Economic theory is applied to current events. May not be taken after ECON 111. Prerequisite: ECON 108, 110, or 115. SO

ECON 117a 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

ECON 121a 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 the mathematics requirement for the major or its equivalent. Elementary techniques from multivariate calculus are introduced and applied, but prior knowledge is not assumed. May not be taken after ECON 125. QR, SO

ECON 122a 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 mathematics requirement for the major or its equivalent. May not be taken after ECON 126. QR, SO

ECON 123a 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

ECON 125a, 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

*** ECON 126b, Macroeconomic Theory** Giuseppe Moscarini

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. May not be taken after ECON 122. QR, SO

ECON 135a, 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

ECON 136b, Econometrics Yuichi Kitamura

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

ECON 159a / GBLB 159a, Game Theory Benjamin Polak

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

ECON 170a, 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 171b / AFAM 146b / EDST 271b, 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 182b / HIST 135b, American Economic History Staff

The growth of the American economy since 1790, both as a unique historical record and as an illustration of factors in the process of economic development. The

American experience viewed in the context of its European background and patterns of industrialization overseas. After introductory microeconomics. WR, SO

*** ECON 185a / GLBL 237a, 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 187a, European Economic History, 1815–1945 Timothy Guinnane

European economic growth and development from the industrialization of Germany and other Continental countries in the early nineteenth century through World War II. The role of institutional development, the role of trade and imperialism, agricultural improvements, and industrialization. After two terms of introductory economics. SO

*** ECON 209a / EP&E 313a or b, Economic Analysis of Law** Robin Landis

This course is intended to provide an introduction to the economic analysis of law. We examine the economic rationale(s) underlying various legal doctrines of both common law and statutory law, as well as the economic consequences of different legal doctrines. Previous coursework in economics, while helpful, is not a prerequisite for the course. SO

*** ECON 212a / PLSC 442a, Introduction to Political Economy** John Roemer

The course is an introduction to important economic ideas: preferences and rationality, Pareto efficiency, economic equilibrium in a capitalist economy, externalities, the role of the state, uncertainty and von Neumann-Morgenstern utility, the principle of insurance, elementary game theory (Nash equilibrium), the median voter theorem, political equilibrium with party competition, distributive justice, equality of opportunity, and Arrow's impossibility theorem. These topics are essential tools for political economists. Prerequisite: One year of calculus or intermediate microeconomics with calculus. SO

ECON 251a, Financial Economics Eduardo Davila

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

ECON 265a, History of Economic Thought Staff

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 326b, 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 330a / EVST 340a, Economics of Natural Resources Robert Mendelsohn
Microeconomic theory brought to bear on current issues in natural resource policy. Topics include regulation of pollution, hazardous waste management, depletion of the world's forests and fisheries, wilderness and wildlife preservation, and energy planning. After introductory microeconomics. QR, SO

ECON 339b, Advance Competition Economics and Policy Fiona Scott Morton
Limits that antitrust laws, as applied and interpreted by agencies, courts, and competitors, place on firm behavior. Economic theories underlying antitrust enforcement. Whether legal rules restricting competitive behavior increase social welfare and how they affect managerial choices. The evidence and reasoning advanced in key antitrust cases; how outcomes may affect social welfare and firm strategies. Goals and procedures of US and EU antitrust agencies. SO

ECON 340b / PLSC 359b, Economics and Politics of Development Gerard Padro
This course covers recent scholarship on the political economy of development. It starts with the study of macro-historical facts and move on to micro issues, such as conflict and corruption. Prerequisite: Intermediate microeconomics and Econometrics (ECON 117 or equivalent).

ECON 350a, 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

ECON 351b, Mathematical Economics: Game Theory Philipp Strack
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

* **ECON 360b, Capital Markets** Gary Gorton
Topics related to capital markets, with emphasis on the financial crisis of 2007-2008. The design, pricing, and trading of corporate bonds, credit derivatives, and money market instruments; bond restructuring, bond ratings, and financial crises; basic tools used to address such issues, including fixed income mathematics, binomial option pricing, and swaps. Prerequisites: intermediate microeconomics and econometrics.

Note: ECON 360a "Capital Markets" is cross-listed with SOM MGT 947a and has space for up to five undergraduates.

ECON 361b, Corporate Finance Christopher Clayton

Financial management from inside the corporation or operating entity. Topics include capital budgeting and valuation, optimal capital structure, initial public offerings, mergers, and corporate restructuring. Cases and problem sets provide applications. Prerequisites: intermediate microeconomics and econometrics.

ECON 363a, The Global Financial Crisis Andrew Metrick

Comprehensive survey of the causes, events, policy responses, and aftermath of the recent global financial crisis. Study of the dynamics of financial crises in a modern economy. Prerequisite: Successful completion of a course in introductory economics.

SO

ECON 365b / CPSC 365b, Algorithms Andre Wibisono

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. Either CPSC 365 or CPSC 366 may be taken for credit. Prerequisites: CPSC 202 and 223. QR

*** ECON 366b / CPSC 366b, Intensive Algorithms** Dan Spielman

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. Either CPSC 365 or CPSC 366 may be taken for credit. Prerequisites: MATH 244 and CPSC 223. QR

ECON 375b / GLBL 219b, 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

*** ECON 407a / GLBL 310a, International Finance** Ana Fieler

A study of how consumers and firms are affected by the globalization of the world economy. Topics include trade costs, the current account, exchange rate pass-through, international macroeconomic co-movement, multinational production, and gains from globalization. Prerequisite: intermediate macroeconomics or equivalent. SO

ECON 409b, 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 410b, The Economics of Innovation** Mitsuru Igami

Study of forces that drive the process of innovation. Creativity and creative destruction; the innovator's dilemma; incentives to innovate; competitive advantage; industry evolution; intellectual property. Use of both formal theoretical models and quantitative empirical studies, as well as descriptive studies from management strategy and economic history. Prerequisites: econometrics and intermediate microeconomics.

*** ECON 411a, 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

ECON 414a, 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. Prerequisites: intermediate microeconomics and econometrics. SO

ECON 419a, 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 424a / GLOBL 308a, 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

*** ECON 428b, Economics of Cities: Regional and Urban Economics** Sun Kyoung Lee

Why do cities exist? Why do firms cluster? Why some U.S. cities have prospered in recent decades while others have declined? What are the structural roots of our housing crises today? This course takes cities as our laboratory and asks important aspects that are reshaping the very fabric of our cities and neighborhoods. Prerequisites: ECON 121, ECON 136. SO

ECON 429b, Data Analysis and Strategy Mitsuru Igami

Study of systematic thinking about competition and strategy using key concepts of microeconomics. Analysis of data, with consideration of economic theory and statistical methods using tools in Excel and Stata. Topics include logical thinking, empirical

analysis, modeling, and estimation. Prerequisite: Introductory Microeconomics; some familiarity with statistics and econometrics is helpful. SO

ECON 433a, 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

*** ECON 434a, 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 435b, The Role of Algorithms in the Economy Staff

The goal of this seminar is to introduce students to algorithms commonly used in commercial applications and to the blockchain technology. Students are asked to program algorithm prototypes and to reflect on existing economic research based on the programming experience gained in the course. Prerequisites: ECON 121, ECON 117, and programming experience in R or Python. SO

ECON 438a, 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 courses in econometrics or statistics, or one course with special permission from the instructor.

SO

*** ECON 441b, Economics of Information, Learning, and Communication** Mira Frick

A theoretical introduction to economic models of social learning and strategic information transmission, using tools from game theory and probability theory. The rationality of individual behavior as affected by pathologies such as herding, informational cascades, or strategic delays; the effectiveness of communication in settings in which an informed agent communicates information to a less informed agent. Prerequisites: intermediate microeconomics, a course in probability theory, and completion of the mathematics requirement for the Economics major. SO

*** ECON 444a, 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

* **ECON 445b, 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 449b / EP&E 244b / PLSC 374b, The Economic Analysis of Conflict** Gerard Padro

Since the end of WWII the overwhelming majority of war casualties have been the result of internal conflict. This includes insurgency situations in which foreign powers prop up a weak internal government. In this course we apply microeconomic techniques, theoretical and empirical, to the analysis of internal conflict, its causes and consequences. Topics include forced migration, ethnic conflict, long-term consequences of war and individual choices to participate in violence. Readings comprise frontier research papers and students will learn to critically engage with cutting-edge research designs. Prerequisites: Intermediate microeconomics and econometrics. SO

* **ECON 450b, Investment Analysis** Dean Takahashi and David Swensen

Examination of investment management in theory and practice. Discussion of asset allocation, investment strategy, and manager selection from the perspective of an institutional investor. Focus on the degree of market efficiency and opportunity for generating attractive returns. SO

* **ECON 456a, 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 463b / BENG 403b, 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 465b / EP&E 224b / GLBL 330b, 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 467a / GLBL 307a, 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. Prerequisites: intermediate microeconomics and macroeconomics. SO

* **ECON 468b, 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 471b / EP&E 297b, Topics in Cooperative Game Theory** Pradeep Dubey

The theory and applications of cooperative games. Topics include matching, bargaining, cost allocation, market games, voting games, and games on networks. Prerequisite: intermediate microeconomics.

* **ECON 472a, 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; strategic choices in innovation and competition; patent races; measurement and big data; the sharing and digitalized economy; collective intelligence and decisions; online auctions; venture capital; legal and social infrastructure. Prerequisites: ECON 115 or equivalent; ECON 121. SO

* **ECON 475a / EP&E 286a, 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. 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 478b, The Economics of Internet Markets** Charles Hodgson

Study of online markets with a focus on ongoing policy debates. Students learn about the workings of online markets by studying economic models of platform markets, consumer search, and advertising auctions. Students apply these frameworks to discussions about the regulation of the internet, including net neutrality, privacy, online media bias, and the monopoly power of "big tech." Readings draw from theoretical and empirical academic studies as well as the popular press. Prerequisites: Intermediate microeconomics and econometrics. SO

* **ECON 480a / GLBL 311a, Banking Crises and Financial Stability** Sigridur Benediktsdottir

Focus on systemic risk, banking crises, financial stability and macroprudential policies. Additional emphasis on systemic risk and prudential policies in peripheral European economies and emerging economies. Prerequisites: ECON 115 and 116, or equivalent. SO

* **ECON 486a, Dynamic Games** Anna Sanktjohanser

This course explores topics on dynamic games: we consider situations where agents interact repeatedly. We cover applications related to a range of fields from industrial organization (price wars and oligopoly with imperfect monitoring) to macroeconomic policy (time consistency). Students should have a solid background in multivariate calculus, be comfortable with rigorous proofs and mathematical arguments, and be willing to learn further mathematical tools as needed. Prerequisites: either ECON 121 or ECON 125, as well as completion of the mathematics requirement of the economics major. SO

* **ECON 488b, Agents & Fiduciaries: Economics and Law** Richard Brooks

The seminar introduces students to the basic models in the principal-agent literature, including moral hazard and adverse selection, as well as the legal structures that regulate agents and other fiduciaries. Prerequisite: Intermediate microeconomics. SO

* **ECON 490b, Immigration and Its Discontents: The Perspective from Economic History** Naomi Lamoreaux

Some policy makers assert that immigrants hurt existing workers and increase the burden of the welfare state, while others claim that immigrants fill necessary jobs and enhance the creativity and dynamism of the economy. The course examines the historical and econometric evidence that scholars have brought to these debates. Prerequisites: Econometrics and either intermediate microeconomics or macroeconomics. SO

* **ECON 491a and ECON 492b, The Senior Essay** Rebecca Toseland and Ebonya Washington

Students wishing to write a senior essay must choose their topics and advisers by Monday, October 5, 2020. One-term senior essays are due on Wednesday December 9 by 4:30 pm. Two-term senior essays are due by 4:30 pm on Wednesday, April 7, 2020. Essays should be submitted electronically to the Economics department (qazi.azam@yale.edu) by the due date. Late essays will not be accepted without a dean's excuse. Advisers are chosen with the assistance of the DUS, lecturer and TA. The format and character of the departmental senior essay may vary to suit the interest of the student and the demands of the topic, but it is expected that the tools and concepts of economic analysis will be employed and that the essay will contain original research. Paper lengths may vary; the normal expectation is thirty pages. Students may receive up to two credits for the senior essay, though it counts as only one departmental seminar whether one or two terms are taken. Please see the canvas page for an introductory video. Senior essay Q&A sessions with the DUS, lecturer and TA for the course will be held on August 13 at 9 am, August 18 at 7 pm and September 1 at 4 pm. RSVP at <https://economics.yale.edu/webform/undergrad-info-session> to receive the zoom link. You'll receive the link just prior to the meeting start time. Senior essay prospectus forms are due Monday, October 5, 2020. Students who do not turn the prospectus in on time will not be permitted to write an essay. NA

* **ECON 498a and ECON 499b, Directed Reading** Ebonya Washington

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.

Education Studies (EDST)

* EDST 065a / HUMS 065a, Education and the Life Worth Living Staff

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 freshmen. Preregistration required; see under Freshman Seminar Program. HU

EDST 110a / SOCY 112a, Foundations in Education Studies Mira Debs

Introduction to key issues and debates in the U.S. public education system. Focus on the nexus of education practice, policy, and research. Social, scientific, economic, and political forces that shape approaches to schooling and education reform. Theoretical and practical perspectives from practitioners, policymakers, and scholars. SO

* EDST 125a / CHLD 125a / PSYC 125a, Child Development Carla Horwitz and Ann Close

The reading of selected material with supervised participant-observer experience in infant programs, a day-care and kindergarten center, or a family day-care program. Regularly scheduled seminar discussions emphasize both theory and practice. An assumption of the course is that it is not possible to understand children – their behavior and development – without understanding their parents and the relationship between child and parents. The focus is on infancy as well as early childhood. Enrollment limited to juniors and seniors. WR, SO

* EDST 127b / CHLD 127b / PSYC 127b, Theory and Practice of Early Childhood Education Carla Horwitz

Development of curricula and responsive educational environments for young children – in light of current research and child development theory. The course focuses on critical analysis of programs for young children and the ways in which political context contributes to the practice of education. Regularly scheduled seminar discussions emphasize both theory and practice. Supervised participant-observer experience in an early childhood classroom. Components of the course include behavior and development, planning, assessment and standards, culture, teacher preparation, and working with families. Priority given to seniors, juniors and Ed Studies students. WR, SO RP

* EDST 128b / CHLD 128b / PSYC 128b, Language, Literacy, and Play Carla Horwitz and Ann Close

The complicated role of play in the development of language and literacy skills among preschool-aged children. Topics include social-emotional, cross-cultural, cognitive, and communicative aspects of play. WR, SO RP

EDST 140a / PSYC 140a, 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

EDST 160b / PSYC 150b, Social Psychology Jennifer Hirsch

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 162a / SOCY 162a, Methods in Quantitative Sociology** Daniel Karell

Introduction to methods in quantitative sociological research. Topics include: data description; graphical approaches; elementary probability theory; bivariate and multivariate linear regression; regression diagnostics. Students use Stata for hands-on data analysis. QR, SO

EDST 180a / PSYC 180a, Clinical Psychology Jutta Joermann

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

*** EDST 205b, Principles of Effective Teaching in the Secondary Classroom** 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 110 is recommended. Preference given to Education Studies Scholars and juniors and seniors interested in post-graduate careers in teaching. SO

*** EDST 209a / AFAM 239a / AMST 461a / ER&M 292a / WGSS 202a, 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. WR, HU

*** EDST 210b, Theory and Practice in American Education** Richard Hersh

An examination of the roles played by primary, secondary, and higher education in American society. The idealized purposes, nature, and value of education compared to actual practice. The goals of education at all levels; the degree to which such goals are

being achieved. Vocational vs. liberal education; the obligations and limits of formal education in helping students overcome social and economic inequities. Preference to Education Studies Scholars and to students who have completed EDST 110. WR, SO

* **EDST 217a / HIST 140Ja, History of American Education** Rachel Rosenberg
Is education a right of every citizen as part of a democratic process? Is it a form of control whereby those with power shape new generations? A way to open access and create meritocracy? A limited resource used to shape the nation? In this course we interrogate these questions, exploring the goal and purpose of American education by various interest groups and different points throughout American history. Keeping both history and our current moment in mind, we consider how our education system has come to be the way it is, and where there were places to make other choices – as well as how these other choices might shed light on possible policy implications today. EDST 110 recommended. HU

* **EDST 223a / PLSC 223a, Learning Democracy: The Theory and Practice of Civic Education** Amir Fairdosi

This is a seminar on the theory and practice of civic education. We begin by investigating philosophies of civic education, asking such questions as: What is civic education and what is its purpose? What knowledge, skills, and values promote human flourishing and the cultivation of a democratic society? What role can and should schools play in this cultivation? In the next part of the course we focus on civic education in practice, exploring various approaches to teaching civics and the empirical evidence in support of each method's effectiveness. We also discuss variations in access to civic education opportunities across socioeconomic, demographic, and national contexts, and how societies might deal with these disparities. SO

* **EDST 225b, Child Care, Society, and Public Policy** Jessica Sager and Janna Wagner
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. Preference in enrollment will go to students who have taken EDST 110, with Education Studies Scholars receiving priority. SO

* **EDST 230b, American Education and the Law** William Garfinkel
Interactions between American primary-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. Recommended preparation: EDST 110. Preference to Education Studies Scholars. SO

EDST 237a / LING 217a / PSYC 317a, 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

* **EDST 238a / PLSC 238a, The Education Beat: Writing on Policy, Learning, and Life**

Jane Karr

Exploration of the national conversation around education issues, and how to write smartly about them. Classes delve into top stories of the last few years—diversity and desegregation, school choice and culture wars, and Covid-19. Students learn journalistic values and methods and how to develop marketable ideas. The class examines approaches to nonacademic writing, including opinion and narratives, and then puts them into practice. Journalists who cover education are frequent guests. WR, SO

* **EDST 255a / AFAM 259a / AMST 309a, Education and Empire** Talya Zemach-Bersin

This course offers an introduction to the transnational history of education in relation to the historical development of the U.S. empire both at home and abroad. By bringing together topics often approached separately—immigration, education, race, colonialism, and the history of U.S. empire—we interrogate the ways that education has been mobilized to deploy power: controlling knowledge, categorizing and policing differences, administering unequal paths to citizenship/belonging, forcing assimilation, promoting socio-economic divides, and asserting discipline and control. EDST 110 recommended. HU

* **EDST 261b, Colloquium: Readings in Education Studies** Talya Zemach-Bersin

This one-half-credit colloquium, required for all newly admitted YES Scholars, supplements the curriculum by introducing scholars to a range of topics, methods and approaches to education studies, acquainting them with the expertise and contributions of faculty teaching in the YES program and their fellow students, and providing them with opportunities for leadership, reflection, and collaboration. In an effort to foster leadership and a vibrant intellectual community, class readings are shaped in collaboration with student participants. Assignments include brief weekly readings, an ongoing class blog, leading class convenings, and collaborative final projects. Prerequisites: EDST 110 and acceptance into the Education Studies MAP. ½ Course cr

* **EDST 263a, Place, Race, and Memory in Schools** Errol Saunders

In the wake of the Black Lives Matter movement and widespread, multiracial protests calling for racial justice across the United States, there is a renewed interest in the roles that schools play in perpetuating racial disparities in American society and the opportunities that education writ large might provide for remedying them. As *places*, schools both shape and are profoundly shaped by the built environment and the everyday experiences of the people that interact with them. Teachers, administrators, students, and parents are impacted by the racialized memories to explain the past, justify the present, and to move them to action for the future. These individual and collective memories of who and where they are, and the traumas, successes, failures, and accomplishments that they have with regard to school and education are essential to understanding how schools and school reforms work. Grounded in four different geographies, this course examines how the interrelationships of place, race, and memory are implicated in reforms of preK-12 schools in the United States. The course uses an interdisciplinary approach to study these phenomena, borrowing from commensurate frameworks in sociology, anthropology, political science, and memory studies with the goal of examining multiple angles and perspectives on a given issue. EDST 110 recommended. SO

*** EDST 270b / AMST 447b / ER&M 367b, Contemporary Native American K-12 and Postsecondary Educational Policy** Matthew Makomenaw

This course will explore current 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 110 recommended SO

EDST 271b / AFAM 146b / ECON 171b, 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 274b, College in Prison** Staff

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 coming 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 110 recommended.

*** EDST 282b / PLSC 417b, 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 110 Foundations in Education Studies recommended. WR, SO

*** EDST 290a, 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.

Preference given to Education Studies Scholars or others who have taken EDST 110.
SO

*** EDST 340b / AFAM 455b / ER&M 438b, Anti-Racist Curriculum and Pedagogy**
Daniel HoSang

This seminar explores the pedagogical and conceptual tools, resources and frameworks used to teach about race and racism at the primary and secondary levels, across diverse disciplines and subject areas. Moving beyond the more limited paradigms of racial colorblindness and diversity, the seminar introduces curricular strategies for centering race and racism in ways that are accessible to students from a broad range of backgrounds, and that work to advance the overall goals of the curriculum. Prerequisite: ER&M 200 or an equivalent course addressing histories of race, ethnicity, and migration. SO

*** EDST 400a, Advanced Topics in Education Studies** Talya Zemach-Bersin

Preparation for a thesis-equivalent capstone project. Building community among each year's cohort through reading seminal texts in Education Studies, while laying the foundation for spring capstone projects through discussion of education studies methodologies and practical research design. First course in the yearlong sequence, followed by EDST 410. EDST 110 and two Education Studies electives. Enrollment limited to senior Education Studies Scholars.

*** EDST 410b, Senior Colloquium and Project** Staff

Culmination of the Education Studies Undergraduate Scholars program. Students conduct a rigorous project on a topic of their choice in education research, policy, and/or practice. Enrollment limited to senior Education Studies Scholars.

*** EDST 471b, Independent Study** Staff

Readings in educational topics, history, policy, or methodology; weekly tutorial and a substantial term essay. RP

*** EDST 478b / MUSI 452b, Music, Service, and Society** Sebastian Ruth

The role of musicians in public life, both on and off the concert stage. New ways in which institutions of music can participate in the formation of civil society and vibrant communities. The potential influence of music on the lives of people experiencing political or social oppression. HU RP

Egyptian (EGYP)

EGYP 110a, 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 117a, Elementary Biblical Coptic I Camille Angelo

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 127. L1 RP

EGYP 120b, Introduction to Classical Hieroglyphic Egyptian II Staff

Continuation of EGYP 110. Prerequisite: EGYP 110. L2 RP

EGYP 127b, Elementary Biblical Coptic II Ramona Teepe

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 117. L2 RP

*** EGYP 131a, Intermediate Egyptian: Literary Texts** John Darnell

Close reading of Middle Egyptian literary texts; introduction to the hieratic (cursive) Egyptian script. Readings include the Middle Kingdom stories of Sinuhe and the Eloquent Peasant and excerpts from Wisdom Literature. Prerequisite: EGYP 120. L3 RP

*** EGYP 141b, 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 120. Counts as L4 if taken after EGYP 131. L3 RP

*** EGYP 229a, Ancient Egyptian Epistolography** John Darnell

This course engages in close reading of ancient Egyptian letters, along with the development of further proficiency in the hieratic (cursive) Egyptian script (students who have no previous experience with hieratic are given an introduction to the writing system). Primary sources include material of Old Kingdom, Middle Kingdom, New Kingdom, and Third Intermediate Period date. Assigned secondary literature includes analyses of the cultural, religious, and historical context of the letters. Prerequisite: At least one L3 or L4 course or permission of instructor. L5 RP

*** EGYP 230a, Medinet Habu Texts** John Darnell

This seminar engages in close reading of a selection of the myriad of inscriptions in the mortuary temple of Ramesses III at Medinet Habu, on the west bank of ancient Waset (Thebes, modern Luxor). The course provides an overview of the most complete temple to survive from the New Kingdom, a "Temple of Millions of Years." Readings sample the full range of inscriptions from the temple, including bandeau texts referring to the temple's construction, historical inscriptions recounting the Sea Peoples invasion and other wars of Ramesses III, religious texts including the processions of Sokar and Min, etc. Additional readings cover supporting materials, such as passages from the Great Papyrus Harris, other monuments of Ramesses III, and late variants of the Book of the Dead. Readings are primarily of hieroglyphic texts, although the course provides an introduction to the cursive hieratic script as well. Prerequisite: at least one L3/4 course or permission of the instructor. RP

*** EGYP 231b, Historical Texts of Egypt and Nubia** John Darnell

This course examines textual evidence regarding Egypt's relationship with Nubia from the Old Kingdom through the Ramesside Period, focusing on close reading of the texts of royal monuments, private autobiographical inscriptions, military dispatches, and graffiti from the Nubian deserts. Background reading about the history and archaeology of ancient Nubia supplements the interpretation of the texts. Some texts are read in the original hieratic script. Prerequisite: at least one L3 course. L5 RP

Electrical Engineering (EENG)

EENG 200a, Introduction to Electronics Mark Reed

Introduction to the basic principles of analog and digital electronics. Analysis, design, and synthesis of electronic circuits and systems. Topics include current and voltage laws that govern electronic circuit behavior, node and loop methods for solving circuit problems, DC and AC circuit elements, frequency response, nonlinear circuits, semiconductor devices, and small-signal amplifiers. A lab session approximately every other week. After or concurrently with MATH 115 or equivalent. QR, WR, SC

EENG 201b, Introduction to Computer Engineering Priya Panda

Introduction to the theoretical principles underlying the design and programming of simple processors that can perform algorithmic computational tasks. Topics include data representation in digital form, combinational logic design and Boolean algebra, sequential logic design and finite state machines, and basic computer architecture principles. Hands-on laboratory involving the active design, construction, and programming of a simple processor. QR

EENG 202a, Communications, Computation, and Control Roman Kuc

Introduction to systems that sense, process, control, and communicate. Topics include information theory and coding (compression, channel coding); network systems (network architecture, routing, wireless networks); signals and systems (linear systems, Fourier techniques, bandlimited sampling); estimation and learning (hypothesis testing, regression, classification); and end-to-end application examples (security, communication systems). MATLAB programming assignments illustrate concepts. Students should have basic familiarity with counting (combinatorics), probability and statistics (independence between events, conditional probability, expectation of random variables, uniform distribution). Prerequisite: MATH 115. AP Stats preferred. QR

EENG 203b, Circuits and Systems Design Hong Tang

Introduction to design in a laboratory setting. A wide variety of practical systems are designed and implemented to exemplify the basic principles of systems theory. Systems include audio filters and equalizers, electrical and electromechanical feedback systems, radio transmitters and receivers, and circuits for sampling and reconstructing music. Prerequisites: EENG 200 QR, SC RP

*** EENG 235a and EENG 236b, Special Projects** Mark Reed

Faculty-supervised individual or small-group projects with emphasis on laboratory experience, 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 during the term preceding enrollment. These courses may be taken at any time during the student's career. Enrollment requires permission of both the instructor and the director of undergraduate studies, and submission to the latter of a one- to two-page prospectus signed by the instructor. The prospectus is due in the departmental office one day prior to the date that the student's course schedule is due. ½ Course cr per term

EENG 310b, Signals and Systems Staff

Concepts for the analysis of continuous and discrete-time signals including time series. Techniques for modeling continuous and discrete-time linear dynamical systems

including linear recursions, difference equations, and shift sequences. Topics include continuous and discrete Fourier analysis, Laplace and Z transforms, convolution, sampling, data smoothing, and filtering. Prerequisite: MATH 115. Recommended preparation: EENG 202. QR

EENG 320a / APHY 320a, Introduction to 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

EENG 325a, Electronic Circuits Fengnian Xia

Models for active devices; single-ended and differential amplifiers; current sources and active loads; operational amplifiers; feedback; design of analog circuits for particular functions and specifications, in actual applications wherever possible, using design-oriented methods. Includes a team-oriented design project for real-world applications, such as a high-power stereo amplifier design. Electronics Workbench is used as a tool in computer-aided design. Additional lab one afternoon per week. Prerequisite: EENG 200. QR RP

EENG 348b / CPSC 338b, Digital Systems Rajit Manohar

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

EENG 400b, Electronic Materials Jung Han

Survey and review of fundamental material issues pertinent to modern microelectronic and optoelectronic technology. Topics include band theory, electronic transport, surface kinetics, diffusion, defects in crystals, thin film elasticity, crystal growth, and heteroepitaxy. Formerly EENG 408. Prerequisite: EENG 320 or permission of instructor. QR, SC

EENG 401a, Photonics and Optical Electronics Jung Han

A survey of the enabling components and devices that constitute modern optical communication systems. Focus on the physics and principles of each functional unit, its current technological status, design issues relevant to overall performance, and future directions. Formerly EENG 410. EENG 320 and APHY 322, or permission of instructor QR, SC

EENG 402b / APHY 418b, Advanced Electron Devices Staff

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

EENG 406b, Photovoltaic Energy Fengnian Xia

Survey of photovoltaic energy devices, systems, and applications, including review of optical and electrical properties of semiconductors. Topics include solar radiation, solar cell design, performance analysis, solar cell materials, device processing, photovoltaic

systems, and economic analysis. Prerequisite: EENG 320 or permission of instructor. QR, SC

*** EENG 422b / CPSC 449b, Computer Architectures and Artificial Intelligence**

Richard Lethin

Introduction to the development of computer architectures specialized for cognitive processing, including both offline 'thinking machines' and embedded devices. The history of machines, from early conceptions in defense systems to contemporary initiatives. Instruction sets, memory systems, parallel processing, analog architectures, probabilistic architectures. Application and algorithm characteristics. Formerly EENG 449. Prerequisites: CPSC 100, CPSC 112, or equivalent programming experience; EENG 325, EENG 348, or equivalent circuits and digital logic experience; or permission of instructor. QR

EENG 426a / CPSC 448a / ENAS 876a, Silicon Compilation Rajit Manohar

An upper-level course on compiling computations into digital circuits using asynchronous design techniques. Emphasis is placed on the synthesis of circuits that are robust to uncertainties in gate and wire delays by the process of program transformations. Topics include circuits as concurrent programs, delay-insensitive design techniques, synthesis of circuits from programs, timing analysis and performance optimization, pipelining, and case studies of complex asynchronous designs. Prerequisite: EENG 201 and introductory programming, or permission of instructor.

EENG 428b, Cloud FPGA Jakub Szefer

This course is an intermediate to advanced level course focusing on digital design and use of Field Programmable Gate Arrays (FPGAs). In addition, it centers around the new computing paradigm of Cloud FPGAs, where the FPGAs are hosted remotely by cloud providers and accessed remotely by users. The theoretical aspects of the course focus on digital system modeling and design using the Verilog Hardware Description Language (Verilog HDL). In the course, students learn about logic synthesis, behavioral modeling, module hierarchies, combinatorial and sequential primitives, and implementing and testing the designs in simulation and real FPGAs. Students also learn about FPGA tools from two major vendors: for Xilinx FPGAs and Intel FPGAs (formerly Altera). The practical aspects focus on designing systems using commercial Cloud FPGA infrastructures: Amazon F1 service (Xilinx FPGAs) or through the Texas Advanced Computing Center (Intel FPGAs). Students learn about cloud computing, interfacing servers to FPGAs, PCIe and AXI protocols, and how to write software that runs on the cloud servers and leverages the FPGAs for acceleration of various computations. Prerequisites: EENG 201 and 348 or permission of the instructor. Students should be familiar with digital design basics and have some experience with Hardware Description Languages such as Verilog or VHDL. QR

*** EENG 432a / AMTH 342a, 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

EENG 434b / MATH 251b / S&DS 351b, Stochastic Processes Staff

Introduction to the study of random processes including linear prediction and Kalman filtering, Poisson 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

EENG 439a, Neural Networks and Learning Systems Priya Panda

Neural networks (NNs) have become all-pervasive giving us self-driving cars, Siri Voice assistants, Alexa, and much more. While deep NNs deliver state-of-the-art accuracy on many artificial intelligence tasks, it comes at the cost of high computational complexity. Accordingly, designing efficient hardware architectures for deep neural networks is an important step towards enabling the wide deployment of NNs, particularly in low-power computing platforms, such as, mobiles, embedded Internet of Things (IoT) and drones. This course aims to provide a thorough overview on deep learning techniques, while highlighting the key trends and advances toward efficient processing of deep learning in hardware systems, considering algorithm-hardware co-design techniques. Prerequisites: MATH 222 or CPSC 202, EENG 201, and knowledge of Python programming.

*** EENG 451a / CPSC 456a, Wireless Technologies and the Internet of Things**

Wenjun Hu

Over the last two decades or so, consumer IoT technologies have evolved from individual analogous devices, to connected devices and then interconnected networks of devices, from data collection to data management, from smart devices to intelligent interfaces. Wireless connectivity is an important driver of IoT technologies. This course aims to weave together fundamental theory of wireless communications, its application to IoT, and the design and implementation of wireless network architectures. The concepts are illustrated using examples such as WiFi and LTE/5G. Particular emphasis is placed on the interplay between concepts and their implementation in real systems. The coursework offers a practical experience, built on lab sessions involving WiFi experiments and simple IoT setups, homework involving Matlab-based analysis, and a student-defined course project that can cater to diverse interests. Students can expect to learn background knowledge of some everyday wireless technologies and how to design systems based on the fundamental communications concepts. Given the nature of these invisible signals, students also gain some experience of dealing with uncertainty in experiments and working towards open-ended goals. Depending on the programming background of the students, we may also explore backend system support in the form of edge or cloud computing. Prerequisites: 1) Introductory courses in mathematics, engineering, or computer science covering basics of the following topics: Linux skills, Matlab programming, probability, linear algebra, and Fourier transform; 2) Or by permission of the instructor. Course material will be self-contained as much as possible. The labs and homework assignments require Linux and Matlab skills and simple statistical and matrix analysis (using built-in Matlab functions). There will be a couple of introductory labs to refresh Linux and Matlab skills if needed.

*** EENG 452a, Internet Engineering** Leandros Tassioulas

Introduction to basic Internet protocols and architectures. Topics include packet-switch and multi-access networks, routing, flow control, congestion control, Internet

protocols (IP, TCP, BGP), the client-server model, IP addressing and the domain name system, wireless access networks, and mobile communications. Prerequisite: a college-level course in mathematics, engineering, or computer science, or with permission of instructor. QR

EENG 454b / AMTH 364b / S&DS 364b, Information Theory Andrew Barron
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

* **EENG 455b, Network Algorithms and Stochastic Optimization** Leandros Tassioulas
This course focuses on resource allocation models as well as associated algorithms and design and optimization methodologies that capture the intricacies of complex networking systems in communications computing as well as transportation, manufacturing, and energy systems. Max-weight scheduling, back-pressure routing, wireless opportunistic scheduling, time-varying topology network control, and energy-efficient management are sample topics to be considered, in addition to Lyapunov stability and optimization, stochastic ordering, and notions of fairness in network resource consumption. QR

* **EENG 468a and EENG 469b, Advanced Special Projects** Mark Reed
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 during the term preceding enrollment. This course may only be taken once and at any appropriate time during the student's career; it does not fulfill the senior requirement. Enrollment requires permission of both the instructor and the DUS, and submission to the latter of a one- to two-page prospectus approved by the instructor. The prospectus is due to the DUS one day prior to the date that the student's course schedule is due.

* **EENG 471a and EENG 472b, Senior Advanced Special Projects** Mark Reed
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 during the term preceding enrollment. This course is only open to seniors and is one of the courses that fulfills the senior requirement. Enrollment requires permission of both the instructor and the DUS, and submission to the latter of a one- to two-page prospectus approved by the instructor. The prospectus is due to the DUS one day prior to the date that the student's course schedule is due.

EENG 475a / BENG 475a / CPSC 475a, 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

* **EENG 481b, Advanced ABET Projects** Roman Kuc

Study of the process of designing an electrical device that meets performance specifications, including project initiation and management, part specification, teamwork, design evolution according to real-world constraints, testing, ethics, and communication skills. Design project consists of electronic sensor, computer hardware, and signal analysis components developed by multidisciplinary teams. Prerequisites: EENG 310, 320, 325, and 348. RP

Energy Studies (ENRG)

* **ENRG 300a, Multidisciplinary Topics in World Energy** Michael Oristaglio

This course studies how the 21st century energy transition away from fossil fuels towards sustainable (sustainable, low-carbon) energy sources is proceeding in key countries and regions around the world such as U.S., Germany, China, India, and Sub-Saharan Africa. The approach is multidisciplinary, encompassing geographical, technological, economic, social and geopolitical incentives and barriers to progress. Enrollment in the Energy Studies MAP is required. SO

* **ENRG 320a / ENVE 320a / MENG 320a, Energy, Engines, and Climate** Alessandro Gomez

The course aims to cover the fundamentals of a field that is central to the future of the world. The field is rapidly evolving and, although an effort will be made to keep abreast of the latest developments, the course emphasis is on timeless fundamentals, especially from a physics perspective. Topics under consideration include: key concepts of climate change as a result of global warming, which is the primary motivator of a shift in energy supply and technologies to wean humanity off fossil fuels; carbon-free energy sources, with primary focus on solar, wind and associated needs for energy storage and grid upgrade; traditional fossil-fuel power plants and engines, that are currently involved in 85% of energy conversion worldwide and we can't "turn on a dime". Elements of thermodynamics are covered throughout the course as needed, including the definition of various forms of energy, work and heat as energy transfer, the principle of conservation of energy, first law and second law, and rudiments of heat engines. We conclude with some considerations on energy policy and with the "big picture" on how to tackle future energy needs. Designed for juniors and seniors in science and engineering. Prerequisite: MENG 211 or permission from the instructor. QR, SC

Engineering & Applied Science (ENAS)

* **ENAS 050a or b / APHY 050a or b / PHYS 050a or b, 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. Preregistration required; see under First-Year Seminar Program. SC

*** ENAS 100b / APHY 100b / EPS 105b / EVST 100b / PHYS 100b, 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

ENAS 110b / APHY 110b, The Technological World Owen Miller

An exploration of modern technologies that play a role in everyday life, including the underlying science, current applications, and future prospects. Examples include solar cells, light-emitting diodes (LEDs), computer displays, the global positioning system, fiber-optic communication systems, and the application of technological advances to medicine. For students not committed to a major in science or engineering; no college-level science or mathematics required. Prerequisite: high school physics or chemistry.

QR, SC

*** ENAS 118a, Introduction to Engineering, Innovation, and Design** Vincent Wilczynski

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 freshmen. RP

*** ENAS 120b / CENG 120b / ENVE 120b, Introduction to Environmental Engineering** Jordan Peccia

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 130b, Introduction to Computing for Engineers and Scientists Beth Anne Bennett

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 151a or b / APHY 151a or b / PHYS 151a 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 194a or b / APHY 194a 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 equivalent, and knowledge of matrix-based operations. QR RP

ENAS 221a, The Materials Science of Art Staff

Exploration of some fundamental scientific principles underlying the engineering of material works of art. The origins of appearance and physical properties, the materials science involved in the fabrication of art works, and the technical analysis of these properties, are discussed in lectures, demonstrated in labs, and illustrated with objects in the Yale museums. This course may be of interest to Art and Architecture majors. SC

* **ENAS 400a, Making it** Joseph Zinter

Positioned at the intersection of design, technology, and entrepreneurship, students are introduced to the many facets of product design and development while simultaneously working to conceive and develop a marketable product and business.

ENAS 441a / MENG 441a, 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

English Language and Literature (ENGL)

* **ENGL 006a / AFAM 017a, Black Nature: African American Nature Writing** Staff

What stories do we tell about nature? How are the stories we are *able* to tell about nature informed by race? And how do these stories shape our understanding of what it means to be human? In contrast to a largely white tradition of nature writing that assumes a superior position outside of Nature, this course undertakes a broad survey of African American nature writing. Over the course of the semester, we read broadly across several genres of African American literature, including: slave narrative, fiction, poetry, drama and memoir. In this way, we center the unique environmental perspectives of those, who, once considered no more than livestock, *were* the nature over which their white masters ruled. Indeed, as those who were drowned in the ocean during the trans-Atlantic slave trade, forced to cultivate the soil on slave plantations, and hung from trees across the Jim Crow South, black Americans are bound up and entangled in nature in incredibly complex and precarious ways. Perhaps for this very reason, however, we may ultimately come to find in these black nature stories the resources for reclaiming a proper relationship to the Earth, and for imagining a sustainable human life in nature, rather than apart from it. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

* **ENGL 010b, Jane Austen** Stefanie Markovits

Close study of Austen's novels, with special attention to the critique of social and literary convention. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

* **ENGL 015b / AFAM 016b / AFST 015b, South African Writing after Apartheid**

Stephanie Newell

An introduction to creative writing published in South Africa from the end of Apartheid in 1994 to the present. Close readings of contemporary fiction with additional material drawn from popular culture, including films, magazines, and music. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.

WR, HU

* **ENGL 029b / AMST 029b, 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. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.

HU

* **ENGL 114a or b, 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. WR

* **ENGL 115a or b, 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 120a or b, 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 121b, Styles of Academic and Professional Prose** Staff

A seminar and workshop in the conventions of good writing in a specific field. Each section focuses on one academic or professional kind of writing and explores its distinctive features through a variety of written and oral assignments, in which students both analyze and practice writing in the field. Section topics, which change yearly, are listed at the beginning of each term on the English departmental website. This course may be repeated for credit in a section that treats a different genre or style of writing; may not be repeated for credit toward the major. Prerequisite: ENGL 114, 115, 120, or another writing-intensive course at Yale. WR

*** ENGL 123a, 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 125a or b, 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. Preregistration required; see under English Department. WR, HU

*** ENGL 126a or b, 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. Preregistration required; see under English Department. WR, HU

*** ENGL 127a or b, 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 128a or b, 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, Ng#g# wa Thiong'o, J. M. Coetzee, Brian Friel, Amitav Ghosh, Salman Rushdie, Alice Munro, Derek Walcott, and Patrick White, among others. Preregistration required; see under English Department. WR, HU

*** ENGL 129a or b / HUMS 127a or b / LITR 168a or b / THST 129a or b, Tragedy in the European Literary Tradition** Staff

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. WR, HU

*** ENGL 130a or b / LITR 169a or b, Epic in the European Literary Tradition** Staff
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. Preregistration required; see under English Department. WR, HU

*** ENGL 150a / LING 150a, Old English** Emily Thornbury
An introduction to the language, literature, and culture of earliest England. A selection of prose and verse, including riddles, heroic poetry, meditations on loss, a dream vision, and excerpts from *Beowulf*, which are read in the original Old English. HU

*** ENGL 153b, The Earliest English Literature** Emily Thornbury
An introduction to the rich literary tradition of Anglo-Saxon England (c. 650 - c. 1100). Emphasis on the diversity of ways the Anglo-Saxons approached, preserved, and appreciated the written word. Readings include poems, histories, travel narratives, and riddles; all readings in Modern English. WR, HU

ENGL 154a / FREN 216a / HUMS 134a / LITR 194a, The Multicultural Middle Ages
Ardis Butterfield and Marcel Elias

Introduction to medieval English literature and culture in its European and Mediterranean context, before it became monolingual, canonical, or author-bound. Genres include travel writing, epic, dream visions, mysticism, the lyric, and autobiography, from the Crusades to the Hundred Years War, from the troubadours to Dante, from the *Chanson de Roland* to Chaucer. Formerly ENGL 189. WR, HU

ENGL 159b / HUMS 213b / LITR 339b / THST 262b, Global Shakespeares: Race, Gender, and the Idea of the Human Ayesha Ramachandran

Shakespeare today is a global phenomenon: over five hundred years after his death, the playwright's legacy continues to flourish with new performances, reworkings, appropriations, and adaptations continuously produced across the world in a range of languages and across various media. Once exported along with the ideologies and practices of empire, Shakespeare's works have now become an index for the complex histories of colonialism and postcolonialism as well as a crucial site for studying processes of racialization and the universalizing idea of "the human." How did Shakespeare become global? Was the cultural imagination of his plays always already global, written at a time with the very notion of the modern world as we know was being shaped? This course explores the political afterlives of "Shakespeare" as a cultural icon and aesthetic touchstone for the Western tradition through a close reading of four plays alongside their adaptations: *Hamlet*, *Othello*, *King Lear*, and *Antony and Cleopatra*. We look at films, novels, *manga* comics, memoirs, stand-up comic routines, along with classic stagings of the plays to elucidate the themes that have made Shakespeare global

– in particular, questions of race, gender, sexuality, generational conflict, and political intrigue. Authors and directors include Akira Kurosawa, Vishal Bharadwaj, Janet Suzman, Iqbal Khan, James Baldwin, Sulayman Al-Bassam, Tayeb Salih, Preti Taneja, and Derek Walcott. This is the non-intensive writing version of LITR 340 and is worth 1 credit. It meets with LITR 340. Students may earn credit for LITR 339 (1 credit) or for LITR 340 (1.5 credits) but not for both. WR, HU

*** ENGL 177a / THST 279a, Medieval Drama** Jessica Brantley

An exploration of medieval dramatic traditions in the context of other medieval and modern performative practices, including pageantry, song, spectacle, recitation, liturgy, and meditative reading. Texts include the York plays, *Everyman*, *Mankind*, the Digby *Mary Magdalene*, Sarah Ruhl's *Passion Play*, and Branden Jacobs-Jenkins' *Everybody*. WR, HU

*** ENGL 182b / AFAM 182b / AMST 286b / HUMS 241b, James Baldwin's American Scene** Jacqueline Goldsby

In-depth examination of James Baldwin's canon, tracking his work as an American artist, citizen, and witness to United States society, politics, and culture during the Cold War, the Civil Rights era, and the Black Arts Movement. HU

ENGL 183a, Poetry since 1950 Langdon Hammer

Poets and poetic movements from the second half of the twentieth century in the United States, England, Ireland, and the Caribbean. Authors include Bishop, Lowell, O'Hara, Ginsberg, Plath, Ashbery, Merrill, Larkin, Gunn, Hill, Heaney, Muldoon, and Walcott. WR, HU

ENGL 189b, Literature and Social Justice Joseph North

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. WR, HU

ENGL 191b / HUMS 206b / LITR 318b / MMES 215b / NELC 201b, The Arabian Nights, Then and Now Robyn Creswell

Exploration of *Arabian Nights*, a classic of world literature. Topics include antecedents, themes and later prose, and graphic and film adaptations. HU

ENGL 194a / WGSS 194a, Queer Modernisms Jill Richards

Study of modernist literature and the historical formation of homosexual identity from the late nineteenth through mid-twentieth centuries. Topics include: sexology as a medical and disciplinary practice; decadence and theories of degeneration; the

criminalization of homosexuality in the Wilde and Pemberton-Billing trials; cross-dressing and drag balls in Harlem; transsexuality and sex-reassignment surgery; lesbian periodical cultures; nightlife and cruising; gay Berlin and the rise of fascism; colonial narratives of same-sex desire; and the salon cultures of expatriate Paris. WR, HU

ENGL 196b / FILM 160b, Introduction to Media John Peters

Introduction to the long history of media as understood in classical and foundational (and even more recent experimental) theories. Topics involve the technologies of modernity, reproduction, and commodity, as well as questions regarding knowledge, representation, public spheres, and spectatorship. Special attention given to philosophies of language, visibility, and the environment, including how digital culture continues to shape these realms. WR, HU

* **ENGL 204a, Shakespeare and Marlowe** Clio Doyle

A study of plays and poems by Shakespeare and his contemporary, Christopher Marlowe. Attention to Elizabethan dramaturgy, poetics, and theater history; to the social, religious, and literary context of the 1580s and '90s in Britain; and to their controversial treatments of politics, religion, mass violence and crowd psychology, gender, race, and sexuality. WR, HU

* **ENGL 205b / HUMS 200b / LITR 195b / MUSI 462b, 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 209a, Beyond the Novel: Genres of Fiction, 1700-1850** Anastasia Eccles

This course studies the astonishing proliferation of fictional genres that shaped the period often narrowly associated with the rise of the novel. Works of fiction in the eighteenth century rarely referred to themselves as novels; more often they called themselves romances or tales, histories or sketches. Lingering with minor genres that are often eclipsed by – or assimilated into – the major genre of the novel, we work to explore their distinctive logics and cultural functions on their own terms. How might thinking “beyond the novel” also allow us to think beyond some its privileged categories – the individual, the nation, the human, the modern? Reading romances, it-narratives, philosophical tales, secret histories, and autobiographies, we also devote special attention to one of the period’s most generically unstable works, Laurence Sterne’s *Tristram Shandy*. Other authors include Jane Austen, Frances Coventry, Maria Edgeworth, Eliza Haywood, Samuel Johnson, Mary Mitford, Leonora Sansay, Mary Prince, and Horace Walpole. WR, HU

* **ENGL 211a / THST 315a, Acting Shakespeare** James Bundy

A practicum in acting verse drama, focusing on tools to mine the printed text for given circumstances, character, objective, and action; noting the opportunities and limitations that the printed play script presents; and promoting both the expressive freedom and responsibility of the actor as an interpretive and collaborative artist in rehearsal. The course will include work on sonnets, monologues, and scenes. Admission by audition. Preference to seniors and juniors; open to nonmajors. See Canvas for application. HU

RP

* **ENGL 213b / HUMS 209b / LITR 487b, The Poetry of Wordsworth and Shelley**

David Bromwich

An exploration of the major poems of William Wordsworth and Percy Shelley, with emphasis on the diverse imaginings required for lyrics and longer works such as *The Prelude* and *Prometheus Unbound*. WR, HU

* **ENGL 222a / THST 390a, 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 225b / WGSS 223b, Race and Gender in Transatlantic Literature, 1688–1818**

Jill Campbell

Construction of race and gender in literatures of Great Britain, North America, and the Caribbean from the late seventeenth to the early nineteenth century. Focus on the role of literature in advancing and contesting concepts of race and gender as features of identity and systems of power, with particular attention to the circulation of goods, people, ideas, and literary works among regions. Some authors include Aphra Behn, Phillis Wheatley, Olaudah Equiano, Leanora Sansay, Maria Edgeworth, Mary Wollstonecraft, and Mary Shelley. First of a two-term sequence; each term may be taken independently. WR, HU

* **ENGL 226a / WGSS 224a, Race and Gender in Transatlantic Literature, 1819 to the Present** Margaret Homans

Construction of race and gender in literatures of Great Britain, North America, and the Caribbean from the early nineteenth century to the present. Focus on the role of literature in advancing and contesting concepts of race and gender as features of identity and systems of power, with particular attention to the circulation of goods, people, ideas, and literary works among regions. Some authors include Charlotte Bronte, Sojourner Truth, Zora Neale Hurston, Virginia Woolf, Audre Lorde, Chimimanda Adichie, and Kabe Wilson. Second of a two-term sequence; each term may be taken independently. WR, HU

* **ENGL 229b, What Was Reading?** Catherine Nicholson and Eve Houghton

This course takes a long and curious view of the history of reading, using primary sources, material objects, historical records, and contemporary debates to unsettle our assumptions about what reading is and does. How have ideas about the meaning and purpose of reading changed over time? What methods or goals have fallen out of favor, and which continue to shape our ideologies of reading today? What relation is there between the reading we do in a Yale English class, and the reading we do on the beach, or at synagogue, or online—and where do those different sorts of reading come from? The syllabus focuses on early modern English literature, but it also engages ongoing debates about reading in the present, seeking both to link them to and distinguish them from earlier controversies. For instance, a unit on reading as religion raises questions about the morally improving (or morally destabilizing) effects of scriptural interpretation that then haunt later debates about the merits and limitations of anti-racist reading, as James Baldwin argues; similarly, early arguments about the effeminating influence of certain books—especially those aimed at women or young readers—give rise to assumptions about gender and genre that still shape our ambivalence toward reading for pleasure. As we explore these older efforts to shape,

inform, regulate, or liberate reading, we'll also experiment with our own readerly practices, using forgotten or neglected forms like the commonplace book, the moral commentary, or the meditation as foils to the more usual modes of academic writing.

WR, HU

* **ENGL 234a / AFAM 206a, Literature of the Black South** Sarah Mahurin
Examination of the intersections between African American and Southern literatures, with consideration of the ways in which the American South remains a space that simultaneously represents and repels an African American ethos. HU

* **ENGL 235b / AMST 346b / HUMS 252b, Poetry and Objects** Karin Roffman
This course on 20th and 21st century poetry studies the non-symbolic use of familiar objects in poems. We meet alternating weeks in the Beinecke library archives and the Yale Art Gallery objects study classroom to discover literary, material, and biographical histories of poems and objects. Additionally, there are scheduled readings and discussions with contemporary poets. Assignments include both analytical essays and the creation of online exhibitions. WR, HU

* **ENGL 238b / WGSS 425b, Disability & Sexuality** Joseph Fischel and Jill Richards
The course examines how intimacies, pleasures, bodies, genders, and sexualities take shape across the spectrum of ability. The course draws from an array of scholarly approaches to dis/ability to theorize normative parameters around sex and sociality, and to imagine alternatives. Most weeks integrate scholarly theoretic texts with cultural artifacts, including poetry, visual art, cinema, podcasts, and other media. Topics include embodiment and gender pluralism, the social model and its discontents, pregnancy and reproductive justice, HIV/AIDS, pornography and representation, toxicity and contagion, care work and dependency, and vulnerability. HU, SO

* **ENGL 239a / AFAM 342a / THST 239a, African American Drama through 1959**
Shane Vogel

This course surveys the formal development and major themes of African American drama from the antebellum period through 1959. We examine how dramatists and performers reimagined the various meanings of Blackness in the U.S. public sphere, as well as individual and collective acts of self-fashioning on and off the stage. Special attention is given to aesthetic experimentation and its relationship to political theater; transformations of genre and form; Black dramatic theory; historical drama; diasporic connections and disconnections; the relationship between music, dance, spectacle, and drama; anti-lynching drama and folk drama; representations of class, gender, and sexuality; inter- and intra-racial conflict; Black radical theatre in the New Deal; and institutional histories of key Black theatre companies. HU

* **ENGL 246a / AMST 245a / PLSC 247a, The Media and Democracy** Joanne Lipman
In an era of "fake news," when mainstream media is attacked as the "enemy of the people" and social platforms are enabling the spread of misinformation, how do journalists hold power to account? Students explore topics including objectivity versus advocacy, and hate speech versus First Amendment speech protections. Case studies will span from 19th century yellow journalism to the media's role in #MeToo and #BlackLivesMatter movements. SO

* **ENGL 248a / HSHM 476a / HUMS 430a / LITR 483a / PHIL 361a, Thought Experiments: Connecting Literature, Philosophy and the Natural Sciences** Paul Grimstad

The course looks closely at the intersection of literature, philosophy and natural science through the lens of the thought experiment. Do thought experiments yield new knowledge about the world? What role does narrative or scene setting play in thought experiments? Can works of literary fiction or films function as thought experiments? Readings take up topics such as personal identity, artificial intelligence, meaning and intentionality, free will, time travel, the riddle of induction, “trolley problems” in ethics and the hard problem of consciousness. Authors may include Mary Shelley, Plato, Albert Einstein, Franz Kafka, H.G. Wells, Rene Descartes, Kazuo Ishiguro, Rivka Galchen, Alan Turing, Hilary Putnam, as well as films (*The Imitation Game*) and television shows (*Black Mirror*). Students should have taken at least one course involving close analysis of works of literature or philosophy. WR, HU

* **ENGL 250a, Romanticism and Anti-Romanticism** Leslie Brisman

Romanticism is traditionally conceived as the “great turn inward,” where interest in exploring the complexities and depths of the human mind replaces a focus on heroic action and social interaction. But the great Romantic poets were equally concerned with interpersonal relations and political problems and reform. Some of the great recent criticism of Romantic Poets emphasize the anti-Romantic elements within the great Romantic poems. This course attempts to focus on both. Readings are mostly in the work of Blake, Coleridge, Wordsworth, Shelley, and Keats, with some attention to Byron, Charlotte Smith, Scott, and the minor poets. WR, HU RP

* **ENGL 255b, Victorian Origins of "Post-Truth" Culture** Leslie Brisman

A course in Victorian poetry with special attention to what might be called “the secularization of blind faith” – the belief, beyond religious faith, that reason, science, common sense, and one’s own or society’s welfare might be set aside in pursuit of some wished-for irreality. The denials of evolution, Higher Criticism, medical science, and social equality may be somewhat different from the “alternative facts” by which many today live, vote, and die, but both the major Victorian poets (Tennyson, Browning) and a host of others (Barrett Browning, Christina Rossetti, Morris, Swinburne, Hardy) were inspired to fight, on one side or the other, in the wars of truth and fiction. Formerly ENGL 312 and ENGL 412. WR, HU

* **ENGL 257a / GMAN 312a / HUMS 208a / LITR 485a, Poe and Kafka** Paul North and Caleb Smith

Some mysteries seem unresolvable by science or religion. For instance, there is the mystery of how people remain hidden from themselves#of repressed impulses and buried truths that find expression in fantasies, dreams, and other strange visions. A word for this mystery is the unconscious. Some terms for its literature include the gothic and the grotesque. Our experimental course pursues this mystery by studying two writers working in different languages, in different centuries, in a variety of minor, unprestigious genres: Edgar Allan Poe and Franz Kafka. We use tales and other short texts by each writer to illuminate the other’s techniques for examining the psychological and political unconscious. WR, HU

* **ENGL 258b / AFAM 305b, African American Autobiography** Sarah Mahurin
Examination of African American autobiography, from slave narratives to contemporary memoirs, and how the genre approaches the project (and problem) of knowing, through reading, the relationships of fellow humans. Chronological consideration of a range of narratives and their representations of race, of space, of migration, of violence, of self, and of other, as well as the historical circumstances that inform these representations. Prerequisite: one college-level literature course. HU

* **ENGL 275b, Emerson, Dickinson, and Melville** Richard Deming
Study of central works by three foundational writers of the nineteenth century. Cultural and historical context; questions concerning American identity, ethics, and culture, as well as the function of literature; the authors' views on the intersections of philosophy and religious belief, culture, race, gender, and aesthetics. Readings include novels, poems, short fiction, and essays. WR, HU

* **ENGL 277b / AFAM 364b, Blackness and the Problem** Staff
In *The Souls of Black Folk* (1903), W.E.B. Du Bois famously theorizes blackness as a serial confrontation with a fundamental question: "How does it feel to be a problem?" This question is in many ways the organizing query of black studies and the devoted preoccupation of this class. Over the course of the semester, we undertake a sustained interrogation of the "problem" of being black, from the advent of racial slavery through to its manifold afterlives. Reading widely across a black literary and intellectual tradition spanning multiple centuries, genres, and disciplines, we explore how black writers not only bear witness to the evolution of the problem of being black over time, but also imagine its redress. Furthermore, we explore how blackness has been conceived as a problem not merely in the conventional sense of an unwelcome condition to be solved or overcome, but also a full and ethical way of dwelling in the world. HU

* **ENGL 278b / AMST 281b, Antebellum American Literature** Michael Warner
Introduction to writing from the period leading up to and through the Civil War. The growth of African American writing in an antislavery context; the national book market and its association with national culture; emergence of a language of environment; romantic ecology and American pastoral; the "ecological Indian"; evangelicalism and the secular; sentimentalism and gender; the emergence of sexuality; poetics. WR, HU

* **ENGL 282a, Writers, Critics, Public Intellectuals** Joe Cleary
This course traces an outline history of modern public intellectuals and offers case studies of landmark intellectual protests, conflicts and controversies from the early nineteenth century to the present. The seminar examines how intellectual ideas are communicated to particular publics and considers the challenges of dealing with public-facing intellectual debate in modern and rapidly changing mediascapes. Works include poetry and fiction, memoirs and manifestoes, critical essays and theoretical articles on publics and public intellectuals. Students are encouraged to think about rhetorical modes of address and reasoned argument; the roles of politics, provocation, passion and precision in public debate and exposé; and the changing nature of public polemic from the emergence of the bourgeois public sphere to the internet age. WR, HU

* **ENGL 287b, Literature and the Future, 1887 to the Present** John Williams
A survey of literature's role in anticipating and constructing potential futures since 1887. Early Anglo-American and European futurism during the years leading up to World War I; futures of speculative fiction during the Cold War; futuristic dreams

of contemporary cyberpunk. What literature can reveal about the human need to understand both what is coming and how to respond to it. WR, HU

* **ENGL 291b / WGSS 340b, Feminist and Queer Theory** Craig Canfield

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

* **ENGL 294b, Novels of Education and Formation** Joe Cleary

An examination of the *bildungsroman* (novel of formation), *künstlerroman* (artist's novel) educational treatise, and campus novels forms, this seminar invites students to reflect on the nature and evolution of modern education and to consider some of the different ways in which the ideals, purposes, challenges, and frustrations of university life have developed from the later nineteenth century to the present in British, American, and postcolonial contexts. For some, the university has always reproduced the interests of traditional elites and consolidated privilege and inequality; for others, the university ought to be a transformative institution for overcoming social ills and divisions of class, race, religion, and gender. A university education is also supposed to be both pleasurable and enlightening! Beginning with classic nineteenth-century writers including Tocqueville, Arnold, Newman, and Hardy on education and cultural aspiration, the course examines major twentieth-century exponents of the *bildungsroman*, *künstlerroman*, and campus novel forms, including distinguished works by Forster, Joyce, Woolf, Waugh, Mary McCarthy, Du Bois, Gandhi, Fanon, Tayib Salih, and J. M. Coetzee, then concluding with notable twenty-first century works on this subject by Zadie Smith, Jeffrey Eugenides, and Sally Rooney. WR, HU

* **ENGL 295a / AFST 295a / LITR 461a, Postcolonial Ecologies** Cajetan Iheka

This seminar examines the intersections of postcolonialism and ecocriticism as well as the tensions between these conceptual nodes, with readings drawn from across the global South. Topics of discussion include colonialism, development, resource extraction, globalization, ecological degradation, nonhuman agency, and indigenous cosmologies. The course is concerned with the narrative strategies affording the illumination of environmental ideas. We begin by engaging with the questions of postcolonial and world literature and return to these throughout the semester as we read the primary texts, drawn from Africa, the Caribbean, and Asia. We consider African ecologies in their complexity from colonial through post-colonial times. In the unit on the Caribbean, we take up the transformations of the landscape from slavery, through colonialism, and the contemporary era. Turning to Asian spaces, the seminar explores changes brought about by modernity and globalization as well as the effects on both humans and nonhumans. Readings include the writings of Zakes Mda, Aminatta Forna, Helon Habila, Derek Walcott, Jamaica Kincaid, Ishimure Michiko, and Amitav Ghosh. WR, HU

* **ENGL 299a / FILM 289a, Nineteenth-Century Media (as/and Literature)** John Peters

In the nineteenth century it is as if someone poured Miracle-Gro on the technological world. This class studies nineteenth-century media and their imaginative consequences. It follows a broad definition of media as material apparatuses that record, transmit, and process the world. Steam, photography, telegraphy, sound-recording, and cinema

were only some of the ways people found their worlds disrupted, both excitingly and distressingly. Literature is, of course, itself a medium, and as a first-rate archive of media history it serves as our chief, but not exclusive, entry-point. Readings include works of literature, recent scholarship, and primary documents or artifacts from the arts and sciences. We may look at paintings, pianos, and weather reports as well as telegrams, photographs, and séances. We work within a long nineteenth century (1789-1914) though mostly focus on the 1830s to 1890s. Our geographical center of gravity is the the UK and US, with occasional side trips to the continent. Questions of empire of course take us elsewhere, and final essays on areas beyond the Anglophone world are welcome. Helpful but not required prerequisites for the class include ENGL 126, 127, 128, and FILM 160. WR, HU

* **ENGL 301b, Topics in Old English Literature** Emily Thornbury

This course allows students to explore the literature of England before 1100, and introduces them to the challenges and rewards of studying the early Middle Ages. It has two tracks: one for students who have completed ENGL 150 or the equivalent and will be working with Old English texts in their original language, and one for students who will be working primarily in translation. Students in both tracks are expected to produce an essay of 15–20 pages as their final project. Topics vary from year to year. In spring 2022, the course focuses on the Exeter anthology of Old English poetry. WR, HU

* **ENGL 302b, 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 303a, Consciousness in the Novel from Austen to Woolf** Ruth Yeazell

Close study of selected novels by Jane Austen, George Eliot, Henry James, and Virginia Woolf, with particular attention to the representation of consciousness and the development of free indirect discourse, as well as recent speculations about so-called theory of mind. Readings supplemented by narrative theory. Pre-1900 with permission of instructor. WR, HU

* **ENGL 323a, Spenser** Catherine Nicholson

A reading of most of *The Faerie Queene*, together with a selection of shorter poems. Emphasis on Spenser's engagement with poetic precursors, his efforts to marry ethical and aesthetic ambitions, and his reinvention of the English language. Formerly ENGL 418 and ENGL 229. WR, HU

* **ENGL 327b / AMST 319b, The Modernist Novel in the 1920s** Joe Cleary

Many of the classics of modernist fiction were published between 1920 and 1930. These novels did not come into the world as “modernist”; that term was later conferred on narrative experiments often considered bizarre at the time. As writers, the “modernists” did not conform to pre-existing social conceptions of “the writer” nor work with established systems of narrative genres; rather, they tried to remake the novel as form and bend it to new purposes. This course invites students to consider diverse morphologies of the Anglophone modernist novel in this decade and to reflect on

its consequences for later developments in twentieth-century fiction. The seminar encourages careful analyses of individual texts but engages also with literary markets, patronage systems, changing world literary systems, the rise of cinema and mass and consumer cultures, and later Cold War constructions of the ideology of modernism.

WR, HU

* **ENGL 329b / HSAR 441b / HUMS 371b / LITR 402b, The Picturebook: Euro-American and Japanese Traditions** Katie Trumpener

Examines the form, history, and preoccupations of the picturebook form from the eighteenth century to the present, juxtaposing Euro-American with Japanese picturebook traditions. HU

* **ENGL 336a, Charles Dickens and George Eliot** Stefanie Markovits

Overview of the works of Charles Dickens and George Eliot through exploration of a series of paired texts that allow perspective on two different approaches to a variety of novelistic modes, including the *Bildungsroman*, the historical novel, and the political novel. Prior course work on Victorian literature and on the novel is recommended.

WR, HU RP

* **ENGL 337b / HUMS 179b, Shakespeare's Political Plays** David Bromwich

Reading and interpretation of selected histories and tragedies from *Richard II* to *The Tempest* with emphasis on the tension between individual freedom and political obligation. WR, HU TR

* **ENGL 341b / EVST 409b, Nature Poetry, from the Classics to Climate Change**
Jonathan Kramnick

Poetry of the natural world, beginning with classical pastoral and ending with lyric responses to climate change. We consider how poetry attempts to make sense of our interaction with the earth at important moments of change, from pre-industrial agriculture to global capitalism and the Anthropocene. WR, HU

* **ENGL 342b, The Poetess and the Woman of Letters** Naomi Levine

Examination of two figures of female authorship from the long nineteenth century: the Poetess and the Woman of Letters. Topics include the gendering of intellectual, artistic, and moral authority; the education of women; the possibility of female genius; the poetics and politics of sentimentality, sympathy, and abolition; the relationships among art, sexuality, and embodiment. Authors include Mary Wollstonecraft, Germaine de Staël, Margaret Fuller, Elizabeth Barrett Browning, Harriet Martineau, Frances Harper, Emily Dickinson, Christina Rossetti, George Eliot, Sarojini Naidu, Pauline Johnson (Tekahionwake), Michael Field, Vernon Lee, Virginia Woolf. WR, HU

* **ENGL 344a / WGSS 426a, Virginia Woolf** Margaret Homans

A study of the major novels and other writings by Virginia Woolf, with additional readings in historical contexts and in Woolf biography and criticism. Focus on Woolf's modernist formal experimentation and on her responses and contributions to political movements of her day, principally feminism and pacifism; attention also to the critical reception of her work, with emphasis on feminist and queer literary criticism and theory. WR, HU

- * **ENGL 345a, Elizabeth Bishop and Robert Lowell** Langdon Hammer
Intensive study of Elizabeth Bishop and Robert Lowell, with a focus on their poetry, personal correspondence, and literary friendship, in the context of key conflicts in postwar American literature and society. WR, HU
- * **ENGL 346a / HUMS 253a / RLST 233a, 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 351a / AFAM 354a / HUMS 370a, Fictions of the Harlem Vogue: Novels, Short Stories, and Novellas of the "Harlem Renaissance"** Ernest Mitchell
In this seminar, we examine the major novels, short stories, and novellas of the Harlem Vogue (1923-1934), the first decade of the Negro Renaissance. Key texts by Jessie Fauset, Nella Larsen, Jean Toomer, and Eric Walrond are central, along with lesser-known works by Zora Neale Hurston and Langston Hughes. We consider critical debates about these texts and their standard designation as part of the "Harlem Renaissance." Careful close reading is emphasized throughout; students are guided through a process of archival research and sustained formal analysis to produce a polished critical essay. WR, HU
- * **ENGL 358b, Literature for Young People** Michele Stepto
An eclectic approach to stories and storytelling for and by children. Authors include Nathaniel Hawthorne, Carlo Collodi, Jean de Brunhoff, Ursula LeGuin, J. K. Rowling, Maurice Sendak, Kate diCamillo, Christopher Paul Curtis, and Neil Gaiman. In most course meetings, we also spend some time discussing a selection of picture books (on reserve) featuring children of color. WR, HU RP
- * **ENGL 371b / AMST 379b / FREN 371b / LITR 477b, Fictions of Canada: Colonialism, Nationalism, Postcolonialism** Katie Trumpener
This seminar explores the literature(s) of Canada in its long history, its considerable linguistic and cultural range, and its complex relationship to political history. 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. Particular focus on Canada's diverse early literatures (from Jesuit hymn to epistolary novel); on the prominent role of women writers across Canadian literature history; on the emergence of an experimental Québécois literature (utilizing Montreal patois as a new literary language) in an era also marked by secularization, modernization and political separatism; of English Canadian attempts to rethink colonial history, and the critiques of Canada's ongoing decolonization process by new generations of indigenous, immigrant and ethnic writers. This course explores both literary history and literary form; the work of internationally famous novelists and poets (Leonard Cohen, Marie-Claire Blais, Margaret Atwood, Alice Munro, Michael Ondaatje) and their innovative local counterparts. Throughout the semester, moreover, our discussion of written literary texts (poems, novels, plays) is supplemented by primarily oral texts, Canadian anthems, ballads, folk, rock and punk songs in a range of Canadian languages). We will thus listen to even as we read Canada. WR, HU
- * **ENGL 377a, 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 Praver Jhabvala, and John Osborne. Formerly ENGL 416. WR, HU RP

* **ENGL 378b / AFAM 449b / AFST 449b, Challenges to Realism in Contemporary African Fiction** Stephanie Newell

Introduction to experimental African novels that challenge realist and documentary modes of representation. Topics include mythology, gender subversion, politics, the city, migration, and the self. Ways of reading African and postcolonial literature through the lenses of identity, history, and nation. Formerly ENGL 449. WR, HU

* **ENGL 385b / WGSS 339b, Fiction and Sexual Politics** Margaret Homans

Historical survey of works of fiction that have shaped and responded to feminist, queer, and transgender thought from the late eighteenth century to the present. Authors include Wollstonecraft, C. Bronte, H. Jacobs, C. P. Gilman, R. Hall, Woolf, Wittig, Walker, Anzaldua, Morrison, Kingston, Winterson, and Bechdel. WR, HU

* **ENGL 395b / HUMS 380b / LITR 154b, 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 404a or b, Reading Fiction for Craft** 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. HU

* **ENGL 407a or b, Introduction to Writing Fiction** Staff

An intensive introduction to the craft of fiction, designed for aspiring creative writers. Focus on the fundamentals of narrative technique and peer review. Formerly ENGL 245.

* **ENGL 408a or b, Introduction to Writing Poetry** Staff

A seminar workshop for students who are beginning to write poetry or who have no prior workshop experience at Yale. Formerly ENGL 246. RP

* **ENGL 411b, American Horror Stories** Richard Deming

From its earliest days, the horror genre, although often denigrated, has had a persistent presence in American literature and culture. This course investigates the reasons for this hold on the American imagination and what its social function has been. We explore how the genre is a way that people can navigate questions concerning identity, gender, sexuality, and ethics, as well as grief, loss, and the fear of isolation. We look at the fraught representations of violence, subjectivity, and otherness these works provide. Texts include novels, short fiction, and films. The course is an exciting blend of creative and critical writing. Students write short creative responses and present on specific films and literary texts. The end of the course culminates in a longer project that can be either a scholarly engagement with specific texts and issues or a creative response that explores the ideas arising from the semester's discussions. This allows students to work with the ideas in ways that most suits their strengths and interests. HU

* **ENGL 418a / EVST 224a, Writing About The Environment** Alan Burdick

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. Formerly ENGL 241. 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 419a / HSAR 460a / HUMS 185a, 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. Formerly ENGL 247. WR, HU

*** ENGL 423b / FILM 397b / THST 228b, Writing about the Performing Arts**
Margaret Spillane

Introduction to journalistic reporting on performances as current events, with attention to writing in newspapers, magazines, and the blogosphere. The idea of the audience explored in relation to both a live act or screening and a piece of writing about such an event. Students attend screenings and live professional performances of plays, music concerts, and dance events. Formerly ENGL 244. WR, HU

*** ENGL 425a or b, Writing the Television Drama** Staff

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. Formerly ENGL 248.

*** ENGL 428b, Young Adult Writing** Jacob Halpern

A course on the craft of fiction writing for young adult readers. At the start of the semester, we read widely in the genre to identify the principles of craft at the sentence – and narrative – level, with the aim of creating a style that is original and a story narrative that is powerful. In the second half of the semester, students read and critique one another's fiction. Open to writers of all levels and abilities. Formerly ENGL 259.

*** ENGL 429b, Writing Humor** Ryan Wepler

Skills essential to humor writing, with an emphasis on texture, tone, character, and narrative. Students read the work of classmates and pieces by professional humor writers with the goal of generating an ever-expanding set of techniques for both reading humor and writing humorously. Formerly ENGL 255. Recommended preparation: ENGL 120. WR

*** ENGL 432b, Writing about Food** Barbara Stuart

Writing about food within cultural contexts. Through reading essays written by the luminaries of the food world, students explore food narratives from many angles, including family meals, recipes, cookbooks, restaurant reviews, memoir, and film. Formerly ENGL 258. WR

* **ENGL 437a / AMST 184a / HUMS 184a, 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

* **ENGL 447a, 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 450b, Daily Themes** Mark Oppenheimer
Writing of prose at the intermediate level. Daily assignments of c. 300 words, a weekly lecture, and a weekly tutorial. Application forms available on the Web by mid-November. Application open to all undergraduates. Counts as a nonfiction course in the writing concentration. WR

* **ENGL 453a / THST 320a, 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 455b, Writing about Oneself** Anne Fadiman
A seminar/workshop/lecture in first-person writing. Students explore a series of themes (e.g., family, love, loss, identity) both by writing about their own lives and by reading American and British memoirs, autobiographies, personal essays, and letters. An older work, often from the nineteenth or early twentieth century, is paired each week with a more recent one on the same theme. WR, HU

* **ENGL 456b / HUMS 427b / JDST 316b / LITR 348b, The Practice of Literary Translation** Peter Cole

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. HU

* **ENGL 459b / EVST 215b / MB&B 459b, 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. WR RP

* **ENGL 460a or b, Advanced Poetry Writing** Staff

A seminar and workshop in the writing of verse. May be repeated for credit with a different instructor. RP

* **ENGL 461b, The Art and Craft of Television Drama** Aaron Tracy

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. 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 462b / FILM 401b / THST 453b, Writing Screenplay Adaptations** Donald Margulies

A workshop on the art of screenplay adaptation. Students read short stories, novels, and non-fiction; the screenplays based on that source material; and view and analyze the final product, the films themselves. Instruction focuses on the form, economy, and structure specific to screenwriting. Weekly writing exercises supplement the creation of a final project: a short screenplay based on source material of the student's choosing.

Previous experience in writing for film or stage would be advantageous but is not required. Restricted to juniors and seniors, or by permission of the instructor. HU

* **ENGL 465a or b, Advanced Fiction Writing** Staff

An advanced workshop in the craft of writing fiction. May be repeated for credit with a different instructor.

* **ENGL 466a, Writing the Contemporary Essay** Cynthia Zarin

A seminar and workshop in the contemporary essay. Public versus private voice, the responsibilities of the essayist, and the evolution of writing in the first person. Readings include essays by Joan Didion, Jonathan Lethem, Jenny Diski, Zadie Smith, M. F. K. Fisher, Bruce Chatwin, John Berger, and Oliver Sacks.

* **ENGL 467a or b / PLSC 253a or b, Journalism** Staff

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 469a, 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 473b, The Journalism of Ideas** James Surowiecki

The history and practice of writing journalistic essays or articles in which the principal actor is a notion or idea. Conventions, tropes, and authorial strategies that give rise to the best work in the genre; focus on twentieth- and twenty-first-century writers such as George Orwell, Hannah Arendt, Janet Malcolm, Michael Lewis, and Ta-Nehisi Coates. Students write their own example of the journalism of ideas. WR, HU RP

* **ENGL 474a, 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 freshmen. HU

* **ENGL 477a / THST 321a, Production Seminar: Playwriting** Deborah Margolin

A seminar and workshop in playwriting with an emphasis on exploring language and image as a vehicle for "theatricality." Together we will use assigned readings, our own creative work, and group discussions to interrogate concepts such as "liveness," what is "dramatic" versus "undramatic," representation, and the uses and abuses of discomfort.

* **ENGL 480b, Reporting and Crafting the Long-form Narrative** Sarah Stillman

A feature-writing workshop in the reporting and writing of memorable long-form magazine narratives. Close readings of exemplary investigative works. Emphasis on reporting strategies and storytelling tools for interviewing diverse subjects, generating suspense, crafting scenes, and reconstructing events through use of human and non-human sources.

* **ENGL 483a / HUMS 428a / JDST 343a / LITR 305a, Advanced Literary Translation**

Robyn Creswell

A sequel to LITR 348, The Practice of Literary Translation. Students apply to this workshop with a project in mind that they have been developing, either on their own or for a senior thesis, and they present this work during the class on a regular basis. Practical translation is supplemented by readings in the history of translation practice

and theory, and by the reflections of practitioners on their art. These readings are selected jointly by the instructor and members of the class. Topics include the history of literary translation – Western and Eastern; comparative approaches to translating a single work; the political dimension of translation; and translation in the context of religion and theology. Class time is divided into student presentations of short passages of their own work, including related key readings; background readings in the history of the field; and close examination of relevant translations by accomplished translators. Students receive intensive scrutiny by the group and instructor. Prerequisite: LITR 348.

* **ENGL 484a, Writing Across Literary Genres** Cynthia Zarin

Students in this writing workshop explore three out of four literary genres over the semester: creative nonfiction (including personal essays and reporting), poetry, playwriting, and fiction. The first half of the semester is devoted to experimentation in three different genres; the second half is spent developing an experimental piece into a longer final project: a one act play, a long poem or set of poems, a short story, or a longer essay. We discuss the work of writers – including Shakespeare, John Donne, Jonathan Swift, Chekhov, Virginia Woolf, W.H. Auden, James Baldwin, Elizabeth Bishop, Derek Walcott, Zadie Smith, Maggie Nelson, and Leanne Shapton – who addressed an idea from two or more perspectives. HU

* **ENGL 487a or b, 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 english.yale.edu/undergraduate/applications-and-deadlines. Prerequisites: two courses in writing.

* **ENGL 488a or b, 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 english.yale.edu/undergraduate/applications-and-deadlines.

* **ENGL 489a or b, The 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 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 english.yale.edu/undergraduate/applications-and-deadlines.

* **ENGL 490a, The Senior Essay I** Stefanie Markovits

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 english.yale.edu/undergraduate/applications-and-deadlines. 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 491b, The Senior Essay II** Stefanie Markovits

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 english.yale.edu/undergraduate/applications-and-deadlines. After ENGL 490.

Environmental Engineering (ENVE)

* **ENVE 120b / CENG 120b / ENAS 120b, Introduction to Environmental Engineering**

Jordan Peccia

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 314a / CENG 314a, 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 315b / CENG 315b, Transport Phenomena II Amir Haji-Akbari

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 320a / ENRG 320a / MENG 320a, Energy, Engines, and Climate** Alessandro Gomez

The course aims to cover the fundamentals of a field that is central to the future of the world. The field is rapidly evolving and, although an effort will be made to keep abreast of the latest developments, the course emphasis is on timeless fundamentals, especially from a physics perspective. Topics under consideration include: key concepts of climate change as a result of global warming, which is the primary motivator of a shift in energy supply and technologies to wean humanity off fossil fuels; carbon-free energy sources, with primary focus on solar, wind and associated needs for energy storage and grid upgrade; traditional fossil-fuel power plants and engines, that are currently involved in 85% of energy conversion worldwide and we can't "turn on a dime". Elements of thermodynamics are covered throughout the course as needed, including the definition of various forms of energy, work and heat as energy transfer, the principle of conservation of energy, first law and second law, and rudiments of heat engines. We conclude with some considerations on energy policy and with the "big picture" on how to tackle future energy needs. Designed for juniors and seniors in science and engineering. Prerequisite: MENG 211 or permission from the instructor. QR, SC

ENVE 373a / CENG 373a, 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 377a / CENG 377a, Water Quality Control** Jaehong Kim

Study of the preparation of water for domestic and other uses and treatment of wastewater for recycling or discharge to the environment. Topics include processes for removal of organics and inorganics, regulation of dissolved oxygen, and techniques such as ion exchange, electro dialysis, reverse osmosis, activated carbon adsorption, and biological methods. Prerequisite: ENVE 120 or permission of instructor. SC RP

ENVE 416b / CENG 416b, 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 438b, 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 441a, 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 448a, Environmental Transport Processes Menachem Elimelech
Analysis of transport phenomena governing the fate of chemical and biological contaminants in environmental systems. Emphasis on quantifying contaminant transport rates and distributions in natural and engineered environments. Topics include distribution of chemicals between phases; diffusive and convective transport; interfacial mass transfer; contaminant transport in groundwater, lakes, and rivers; analysis of transport phenomena involving particulate and microbial contaminants. Prerequisite: ENVE 120 or permission of instructor. QR, SC

ENVE 473b, Air Quality and Energy Drew Gentner
The production and use of energy explored as a source of air pollution worldwide. Assessment of emissions and physical/chemical processes; the effects of emissions from energy sources; the behavior of pollutants in energy systems and in the atmosphere. Topics include traditional and emerging energy technology, climate change, atmospheric aerosols, tropospheric ozone, and transport/modeling/mitigation. Prerequisite: ENVE 373 or equivalent. SC

* **ENVE 490a or b, Senior Project** John Fortner
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 020a, Sustainable Development in Haiti** Gordon Geballe
The principles and practice of sustainable development explored in the context of Haiti's rich history and culture, as well as its current environmental and economic impoverishment. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR

* **EVST 030a / ARCG 031a / NELC 026a, Origins of Civilization: Egypt and Mesopotamia** Harvey Weiss
The origins of the earliest civilizations in Mesopotamia and Egypt along the Nile and Tigris-Euphrates Rivers explored with archaeological, historical and environmental data for the origins of agriculture, the classes and hierarchies that marked earliest cities, states and empires, the innovative monumental architecture, writing, imperial

expansion, and new national ideologies. How and why these civilizational processes occurred with the momentous societal collapses at periods of abrupt climate change. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU, SO

*** EVST 040a, Collections of the Peabody Museum** David Skelly

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. SC

*** EVST 060b, 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. Preregistration required; see under First-Year Seminar Program. WR, SO

*** EVST 100b / APHY 100b / ENAS 100b / EPS 105b / PHYS 100b, 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

EVST 127a / ER&M 127a / SOCY 127a / WGSS 127a, Health and Illness in Social Context Alka Menon

Present-day medicine and health care provide solutions to an ever-increasing array of human problems. Yet the achievement of health can be elusive. This course provides a broad introduction to the domains of health and illness in the U.S., with some coverage of international trends and topics. Students analyze how our personal health and public health are shaped by social structures, political struggles, expert knowledge, and medical markets. Topics include the cultural and social meanings associated with health and illness; inequalities in health and health care access and provision; controversies surrounding healthcare, medical knowledge production, and medical decision-making; and the social institutions of the health care industry. None SO

EVST 189b / HIST 246b, The History of Food Paul Freedman

The history of food and culinary styles from prehistory to the present, with a particular focus on Europe and the United States. How societies gathered and prepared food. Changing taste preferences over time. The influence of consumers on trade, colonization, and cultural exchange. The impact of colonialism, technology, and globalization. The current food scene and its implications for health, the environment, and cultural shifts. HU

EVST 196a / AFAM 196a / AMST 196a / ER&M 226a / SOCY 190a, Race, Class, and Gender in American Cities Laura Barraclough

Examination of how racial, gender, and class inequalities have been built, sustained, and challenged in American cities. Focus on the twentieth and twenty-first centuries. Topics include industrialization and deindustrialization, segregation, gendered public/private split, gentrification, transit equity, environmental justice, food access, and the

relationships between public space, democracy, and community wellbeing. Includes field projects in New Haven. SO

EVST 211b / EPS 211b / HIST 416b / HSHM 211b, Global Catastrophe since 1750 Bill Rankin

A history of the geological, atmospheric, and environmental sciences, with a focus on predictions of global catastrophe. Topics range from headline catastrophes such as global warming, ozone depletion, and nuclear winter to historical debates about the age of the Earth, the nature of fossils, and the management of natural resources. Tensions between science and religion; the role of science in government; environmental economics; the politics of prediction, modeling, and incomplete evidence. HU

* **EVST 212a / EP&E 390a / PLSC 212a, 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 215b / ENGL 459b / MB&B 459b, 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. WR RP

EVST 219a / PHIL 290, Philosophical Environmental Ethics Stephen Latham
This is a philosophical introduction to environmental ethics. The course introduces students to the basic contours of the field and to a small number of special philosophical problems within the field. No philosophical background is required or expected. Readings are posted on Canvas and consist almost entirely of contemporary essays by philosophers and environmentalists. SO

EVST 223a / E&EB 220a, General Ecology David Vasseur and Carla Staver
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

* **EVST 224a / ENGL 418a, Writing About The Environment** Alan Burdick
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. Formerly ENGL 241. 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 227b, Energy and Environmental Policy Solutions for the Anthropocene**

Robert Klee

Study of innovative energy and environmental policy solutions for the problems of the Anthropocene—the new epoch of human dominance of the earth. Students explore policies for effective deployment of renewables, smart grids, corporate responsibility, emerging contaminants, zero emission vehicles, environmental information disclosure, carbon sequestration, climate adaptation, sustainable cities, and environmental education. Students critically examine these policies through the lenses of equity and environmental justice, economic impacts (positive and negative), co-benefits, communication, legal governance systems, and politics.

*** EVST 228a / HIST 459Ja / HUMS 228a / LITR 345a, 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 234La, 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 244a, Coastal Environments in a Changing World** Mary Beth Decker

The effects of human action and natural phenomena on coastal marine ecosystems. Methods used by coastal scientists to address environmental issues; challenges associated with managing and conserving coastal environments. Priority to Environmental Studies majors; open to nonmajors as space permits. SC

*** EVST 255b / F&ES 255b / GBL 282b / PLSC 215b, Environmental Law and Politics: Global Food Challenges** John Wargo

We explore relations among food, environment, health, and law. We consider global-scale *avoidable* challenges such as: starvation and malnutrition, obesity, other food related human diseases, climate instability, soil loss, water depletion and contamination, microbial hazards, chemical contamination, food waste, dietary convergence, air pollution, energy, packaging, culinary globalization, and biodiversity loss. We focus on laws that influence the world's food system, including those intended to reduce or prevent environmental and health damages. Other laws protect rights of secrecy, property, speech, confidential business information, free trade, worker protection, equal opportunity, and freedom from discrimination. Ethical concerns of justice, equity, and transparency are prominent themes. Examples of effective law, consumer movements and corporate innovations provide optimism for the future of responsible food. SO

*** EVST 290b / F&ES 290b, Geographic Information Systems** Charles Tomlin

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, animation, transformation, analysis, and synthesis of cartographic data in digital form.

EVST 292a / GLBL 217a / PLSC 149a, Sustainability: Environment, Energy, and the Economy in the 21st Century Daniel Esty

Sustainability as a guiding concept for addressing twenty-first century tensions between economic, environmental, and social progress. Using a cross-disciplinary set of materials from the “sustainability canon,” students explore the interlocking challenges of providing abundant energy, reducing pollution, addressing climate change, conserving natural resources, and mitigating the other impacts of economic development. SO

* **EVST 299b, Sustainable Development Goals and Implementation** Gordon Geballe

Students develop an understanding of the United Nation’s Sustainable Development Goals (SDGs), and focus on how to manage projects that implement the SDGs. Students develop an understanding of the global sustainability agenda, studying each SDG in detail. Students explore and acquire practical project management skills. The course also taps into the expertise and experience of professors and staff from various disciplines and schools, as well as practitioners directly from the field.

* **EVST 304b / AMST 348b / ER&M 381b, Space, Place, and Landscape** Laura Barraclough

Survey of core concepts in cultural geography and spatial theory. Ways in which the organization, use, and representation of physical spaces produce power dynamics related to colonialism, race, gender, class, and migrant status. Multiple meanings of home; the politics of place names; effects of tourism; the aesthetics and politics of map making; spatial strategies of conquest. Includes field projects in New Haven. SO

EVST 318b / AMST 236b / HIST 199b / HSHM 207b, American Energy History Paul Sabin

The history of energy in the United States from early hydropower and coal to present-day hydraulic fracturing, deepwater oil, wind, and solar. Topics include energy transitions and technological change; energy and democracy; environmental justice and public health; corporate power and monopoly control; electricity and popular culture; labor struggles; the global quest for oil; changing national energy policies; the climate crisis. WR, HU

* **EVST 323a, 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 324a / ANTH 322a / SAST 306a, Environmental Justice in South Asia**

Kalyanakrishnan Sivaramakrishnan

Study of South Asia's nation building and economic development in the aftermath of war and decolonization in the 20th century. How it generated unprecedented stress on natural environments; increased social disparity; and exposure of the poor and minorities to environmental risks and loss of homes, livelihoods, and cultural resources. Discussion of the rise of environmental justice movements and policies in the region as the world comes to grips with living in the Anthropocene. SO

EVST 340a / ECON 330a, Economics of Natural Resources Robert Mendelsohn

Microeconomic theory brought to bear on current issues in natural resource policy. Topics include regulation of pollution, hazardous waste management, depletion of the world's forests and fisheries, wilderness and wildlife preservation, and energy planning. After introductory microeconomics. QR, SO

EVST 347a, Introduction to Environmental Chemistry Gaboury Benoit

Introduction to environmental chemistry and to the nature and behavior of environmental pollutants, including chemical, biological, and physical processes. The fundamental classes of chemical reactions in the environment; critical analysis of chemical data; sampling techniques; analytical methods; natural biogeochemical controls on environmental chemistry. Case studies examine contaminants of special interest such as acid precipitation, nutrients, and sewage. SC

* **EVST 350a, 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 351b / NELC 390b, The Anthropocene** Harvey Weiss

"The Anthropocene" is the recent and informal designation for the period during which human activity has transformed the Earth. The Anthropocene is now the subject of intense research and debate among environmental historians, archaeologists, botanists, and climate system modelers. The reasons for this are clear: we need to know the history of the Earth's transformation(s) in order to understand present rates of atmospheric, climatic, environmental, demographic, land use, and biodiversity change. What were the magnitudes and rates of these changes, individually or synchronously, over the past 10,000 years? 4000 years? 100 years? Are these rates of change "normal," unusual, benign, unimportant, or "dangerous?" SO

* **EVST 377b / ANTH 376b, Observing and Measuring Behavior** Eduardo Fernandez-Duque

Survey of theoretical issues and practical methods relevant to the study of animal and human behavior, primarily in the wild. Topics include research design, behavioral

and ecological sampling protocols, basic methods for data analysis, including simple descriptive and analytical statistics, and widely-used technologies that facilitate the study of behavior, such as radiotelemetry. Working around a specific research question, students design their own behavioral study. Prerequisite: Course in evolutionary biology or in the study of animal behavior. SC, SO

EVST 394a, Current Topics in Global Climate Change Staff

People are currently mining millions of years' worth of stored photosynthetic carbon from the solid Earth and transferring it to the atmosphere where it is profoundly changing the chemistry, physics, and biology of the atmosphere, land, and oceans. Exchanges with the oceans and land surface have been modified substantially, so that currently only about half of anthropogenic emissions remain in the atmosphere. These "carbon sinks" are poorly understood, contributing a great deal of uncertainty to future climate. We consider biogeochemical and transport processes in land ecosystems, the oceans, and atmosphere as well as anthropogenic emissions. We conclude with a study of changes in carbon cycling in the past and future, including predictions by coupled Earth System Models. SO

* **EVST 396a 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 409b / ENGL 341b, Nature Poetry, from the Classics to Climate Change**

Jonathan Kramnick

Poetry of the natural world, beginning with classical pastoral and ending with lyric responses to climate change. We consider how poetry attempts to make sense of our interaction with the earth at important moments of change, from pre-industrial agriculture to global capitalism and the Anthropocene. WR, HU

* **EVST 415b / BENG 405b, Biotechnology and the Developing World** Anjelica

Gonzalez

Study of technological advances that have global health applications. Ways in which biotechnology has enhanced quality of life in the developing world. The challenges of implementing relevant technologies in resource-limited environments, including technical, practical, social, and ethical aspects. Prerequisite: MCDB 120, or BIOL 101 and 102.

* **EVST 422a / ANTH 409a / ER&M 394a / F&ES 422a / GLBL 394a, Climate and Society from Past to Present** Michael Dove

Discussion of the major currents of thought – both historic and contemporary – regarding climate, climate change, and society; focusing on the politics of knowledge and belief vs disbelief; and drawing on the social sciences and anthropology in particular. WR, SO

EVST 429b, Caribbean Coastal Development: Science and Policy Gaboury Benoit and Mary Beth Decker

This seminar explores human-ecosystem interactions at the land-sea interface in the tropics, with Caribbean islands as the main study sites. Many tropical islands are undergoing rapid, uncontrolled development, placing severe local stress on several unique and vulnerable ecosystems types. In addition, human induced environmental changes on scales up to global also impose stresses. This course examines the normal functioning of these ecosystems, scientific methods to evaluate and characterize ecosystem condition and processes, how human activities interfere with natural cycles in biophysical systems, and what management and policy tools can be applied to reduce impacts. SC, SO

EVST 431b, 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 444b / F&ES 344b, Aquatic Chemistry** Gaboury Benoit

A detailed examination of the principles governing chemical reactions in water. Emphasis on developing the ability to predict the aqueous chemistry of natural, engineered, and perturbed systems based on a knowledge of their biogeochemical setting. Calculation of quantitative solutions to chemical equilibria. Focus on inorganic chemistry. Topics include elementary thermodynamics, acid-base equilibria, alkalinity, speciation, solubility, mineral stability, redox chemistry, and surface complexation reactions. SC

*** EVST 454b / PLSC 454b, Data Science for Politics and Policy** Fredrik Sävje

Data plays an increasingly important role in policy making and politics. The ability to draw valid conclusions from quantitative information can tilt elections or be the difference between a successful or failed policy. This course teaches how to use tools from statistics, data science, and machine learning to solve problems and challenges faced in policy making and politics. Students learn how data can help people make campaign decisions, detect election fraud, predict election outcomes, and investigate if a policy had the intended effect. Students receive an introduction to statistical programming in R, supervised and unsupervised machine learning, and causal inference. QR, SO

*** EVST 463a / AMST 463a / FILM 455a / THST 457a, 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 473a / ANTH 473a / ARCG 473a / NELC 473a, Climate Change, Societal Collapse, and Resilience** Harvey Weiss

The coincidence of societal collapses throughout history with decadal and century-scale abrupt climate change events. Challenges to anthropological and historical paradigms of cultural adaptation and resilience. Examination of archaeological and historical records and high-resolution sets of paleoclimate proxies. HU, SO

* **EVST 496a or b, Senior Research Project and Colloquium** Michael Fotos, Robert Klee, Jeffrey Park, and Kealoha Freidenburg

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. Students typically complete a two-term senior essay, but students completing the requirements of two majors may consider a one-term senior project.

Ethics, Politics, & Economics (EP&E)

EP&E 203a / PLSC 452a / S&DS 102a, Introduction to Statistics: Political Science

Jonathan Reuning-Scherer

Statistical analysis of politics, elections, and political psychology. Problems presented with reference to a wide array of examples: public opinion, campaign finance, racially motivated crime, and public policy. QR

EP&E 209a / PLSC 453a / S&DS 103a / S&DS 112Ea, Introduction to Statistics: Social Sciences Jonathan Reuning-Scherer

Descriptive and inferential statistics applied to analysis of data from the social sciences. Introduction of concepts and skills for understanding and conducting quantitative research. QR

* **EP&E 215a or b, Classics of Ethics, Politics, and Economics** Boris Kapustin

A critical examination of classic and contemporary works that treat problems of ethics, politics, and economics as unities. Topics include changing conceptions of private and public spheres, the content and domain of individual freedom, and ethical and political limits to the market. Readings from the works of Aristotle, Hobbes, Locke, Smith, Bentham, Mill, Hegel, Marx, Hayek, Rawls, and others. HU, SO

* **EP&E 216a, Classics of EPE: African-American Perspectives** Gregory Collins

The purpose of this course is to examine the interdisciplinary subjects of ethics, politics, and economics through the lens of African-American thought and to grasp how African-American thinkers have deepened our understanding of the interaction between race and socioeconomic debates and controversies throughout U.S. history. Far from being a univocal tradition, African-American thought encompasses a rich variety of intellectual perspectives that have critically assessed the impact of slavery, education, capitalism, and religion, among a number of topics, on African-Americans. While the study of American racial relations can include a wide range of topics, our thematic focus remains on the ethical, political, sociological, and economic dimensions of African-American experiences from the eighteenth century to the present day. This inquiry further prompts us to reflect on the various conceptions of liberty, justice, and equality that have informed the Declaration of Independence and U.S. Constitution and that lie at the core of intellectual discussion over race in American history. HU

EP&E 220b / PLSC 342b, Strategic Models of Politics Milan Svobik

Introduction to formal political theory including application of rational choice and game theoretic analysis. Key topics and findings include: why voters vote in elections; how candidates choose platforms; why common resources tend to be overexploited; whether the state is needed for public good provision; how electoral systems shape politicians' and voters' behavior; whether voters can hold politicians accountable for their performance in office; how constitutions affect politicians' incentives to compromise; and why countries fight wars. SO

*** EP&E 224b / ECON 465b / GLBL 330b, 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 241a / PLSC 415a / SOCY 172a, Religion and Politics in the World** Katharine Baldwin

A broad overview of the relationship between religion and politics around the world, especially Christianity and Islam. Religions are considered to constitute not just theologies but also sets of institutions, networks, interests, and sub-cultures. The course's principal aim is to understand how religion affects politics as an empirical matter, rather than to explore moral dimensions of this relationship. SO

*** EP&E 244b / ECON 449b / PLSC 374b, The Economic Analysis of Conflict** Gerard Padro

Since the end of WWII the overwhelming majority of war casualties have been the result of internal conflict. This includes insurgency situations in which foreign powers prop up a weak internal government. In this course we apply microeconomic techniques, theoretical and empirical, to the analysis of internal conflict, its causes and consequences. Topics include forced migration, ethnic conflict, long-term consequences of war and individual choices to participate in violence. Readings comprise frontier research papers and students will learn to critically engage with cutting-edge research designs. Prerequisites: Intermediate microeconomics and econometrics. SO

*** EP&E 250a / PLSC 354a, 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 286a / ECON 475a, 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. 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.

EP&E 295a / PLSC 344a, Game Theory and Political Science Ian Turner

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

*** EP&E 297b / ECON 471b, Topics in Cooperative Game Theory** Pradeep Dubey

The theory and applications of cooperative games. Topics include matching, bargaining, cost allocation, market games, voting games, and games on networks. Prerequisite: intermediate microeconomics.

*** EP&E 299a / GLBL 299a / PLSC 332a, Philosophy of Science for the Study of Politics** Ian Shapiro

An examination of the philosophy of science from the perspective of the study of politics. Particular attention to the ways in which assumptions about science influence models of political behavior, the methods adopted to study that behavior, and the relations between science and democracy. Readings include works by both classic and contemporary authors. SO

*** EP&E 302a / GLBL 259a / HIST 469Ja / PLSC 391a, State Formation** Didac Queralt

Study of the domestic and international determinants of functional states from antiquity to date. Analysis of state-formation in Europe in pre-modern and outside Europe from colonial times to date. Topics include centralization of power, capacity to tax, and contract enforcement. SO

*** EP&E 306a / PLSC 228a, 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 307a, Culture, Social Norms, and Business Ethics** Staff

Culture is a central concept in the social sciences but it is also one of the most difficult to study. Many argue that culture influences our attitudes and behavior, yet rigorously understanding culture and its implications for behavior and business ethics remains elusive. In the first half of the course, we study some of the most important conceptual literature on culture in the social sciences. We also survey empirical literature to discuss the relevance of culture for socioeconomic, political, and business behavior. In the second half of the course, we examine interventions that, short of upending culture, try to transform some social norms or values of a society or organization in order to improve its members’ behavior (e.g. reducing corruption,

increasing social trust). We briefly consider the effects of reforming legal norms, but we devote most of our time to study experimental interventions and case studies aimed at improving behavior and business ethics in the public and private sectors. The class is explicitly interdisciplinary. The goal is to gain exposure to different approaches to study culture and to interventions aimed at changing norms and behaviors. The course includes a few guest lectures from expert practitioners. so

*** EP&E 309a, Democracy Incorporated: Business, Politics, and Ethics** Staff

Until recently, business corporations and the market economy were mostly associated with the promotion of individual freedoms and the advancement of political rights. Technological change, economic deregulation, and market concentration have increased the power of business corporations. This growing power has led many citizens to believe that corporations are now disempowering individuals. How is corporate power used for political purposes? Where should societies draw the line limiting the transformation of economic into political power? These are the main questions that motivate this course, which investigates the relationship between politics and business. We study how corporations attempt to influence public policy and how political actors seek to shape corporate decisions. We also examine how political institutions and democratic accountability affect government-business relations. Throughout the course, we pay close attention to research design and to the effective communication of research findings. Discussions also emphasize the normative implications of powerful corporations to democracy and democratic theory. so

*** EP&E 312a / PLSC 297a, Moral Choices in Politics** Boris Kapustin

A study of how and why people make costly moral choices in politics. Figures studied include Thomas More, Abraham Lincoln, Nelson Mandela, Václav Havel, and Aung San Suu Kyi. so

*** EP&E 313a or b / ECON 209a, Economic Analysis of Law** Robin Landis

This course is intended to provide an introduction to the economic analysis of law. We examine the economic rationale(s) underlying various legal doctrines of both common law and statutory law, as well as the economic consequences of different legal doctrines. Previous coursework in economics, while helpful, is not a prerequisite for the course. so

*** EP&E 317a / AFST 324a / HIST 368Ja / PLSC 324a, Nelson and Winnie Mandela**
Jonny Steinberg

A study of Nelson and Winnie Mandela's marriage and public careers and the political and philosophical questions the marriage raises. Students examine the Mandelas' conflicting ideas on race and on the colonial experience and compare them to those of Mohandas Gandhi and Franz Fanon. Students also read recent philosophical work on forgiveness and on violence in order critically to assess the politics of reconciliation that so divided the Mandelas. The course examines the politics of global celebrity and the portrayal of men and women in public media.

*** EP&E 325b / PLSC 304b, Business Ethics and Law** Robin Landis

This seminar is intended to provide frameworks for the analysis of ethical issues that may arise in the context of business decisions, including such aspects as the role of ethics, competing values and interests, and tools for making principled decisions. The course also covers, as appropriate, some aspects of law as they relate to business ethics. Previous courses in philosophy and ethics may be helpful. so

EP&E 331b / PLSC 177b, Networks and NGOs in World Politics Sarah Bush

Non-state actors are increasingly important to world politics. This course introduces students to the variety of non-state actors that are currently influencing our world, including non-governmental organizations (NGOs) and transnational networks related to advocacy, crime, global governance, and violence. Students develop a working understanding of these actors' roles in shaping war, peace, human rights, democracy, the global economy, and various other aspects of contemporary global politics. SO

*** EP&E 334b / PHIL 455b, 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 346a / HLTH 420a, Global Health Ethics** Cara Fallon

When a new virus sweeps the globe, how should physicians, governments, and societies respond? What are an individual's rights and responsibilities in the face of illness, and how do public health organizations prioritize competing claims? How should issues of consent, quarantine, compulsory treatment, and surveillance be managed, and how do these issues change as they transcend geographic borders? This seminar examines critical issues in global health through the method of ethical analysis. The course begins with the foundations for analyzing ethical problems, considering moral and ethical frameworks for health. We examine dilemmas such as quarantines, access to care, and the limits of autonomy, and we delve into critical challenges of vulnerable populations and global inequities. We conclude by analyzing emerging tensions posed by artificial intelligence and digital health technologies. Drawing together global health perspectives and ethical analysis, we consider the principles, tradeoffs, and central tensions that inform global health today. WR, SO

*** EP&E 350a / AFST 385a / HIST 391Ja / HLTH 385, Pandemics in Africa: From the Spanish Influenza to Covid-19** Staff

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 353b / PLSC 305b, Critique of Political Violence** Boris Kapustin

Methods of conceptualizing political violence that are prevalent in contemporary political philosophical discourse. Use of theoretical-analytical tools to examine the modes violence assumes and the functions it performs in modern political life as well as the meanings and possibilities of nonviolence in politics. SO

* **EP&E 356a, Constitutional Law and Business Ethics** Gregory Collins

This course has three specific aims: 1) Examine influential Supreme Court cases that have had a significant impact on the practice of American business activities; 2) Identify the critical ethical questions that these legal controversies raise about such activities; and 3) Connect these legal and ethical insights to a broader theoretical understanding of the proper role of government in regulating private economic activity. Prerequisites: Familiarity with major theories in the business ethics discipline (virtue ethics, deontological ethics, utilitarianism, natural rights theory) and the U.S. Constitution.

* **EP&E 362b / PHIL 462b, The Morality of Reparations** Stephen Darwall

The history of chattel slavery and its long legacy, even to the current moment, is a history of almost unimaginable injustice. What is the appropriate moral response to this history? This turns out to be a complex and difficult question, or set of questions, which we explore in this course. Some of these are issues of philosophical theory, however, of “nonideal theory,” where the questions concern not what is ideally just, but what responses are called for by historical injustice. But there are also important empirical historical issues concerning the precise character of the injustices and who, and what institutions, were complicit in them. We examine, as best we can, the history of chattel slavery and its long legacy: the white reaction to what Du Bois called “black reconstruction,” racist violence and terror, and decades of white supremacy, including segregation in all its forms and, most recently, mass incarceration. Ultimately, however, our questions are philosophical. What response does justice require to this history and of whom is it required? HU

* **EP&E 380a / PLSC 313a, Bioethics, Politics, and Economics** Stephen Latham

Ethical, political, and economic aspects of a number of contemporary issues in biomedical ethics. Topics include abortion, assisted reproduction, end-of-life care, research on human subjects, and stem cell research. SO

* **EP&E 390a / EVST 212a / PLSC 212a, 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 421b / PLSC 320b, Ethics, Law, and Current Issues** Karen Goodrow

Examination of how freedom of speech and bias influence the criminal justice system, focusing on wrongful convictions and administration of the death penalty. Understanding the role of potential bias at various levels and the competing interests of

protecting speech, due process, and the innocent. Topics include limitations on speech, practical effects of speech, the efficacy of the death penalty, actual innocence, gender/race/economic bias and its effects on the justice system, as well as best practices for improving our sense of justice.

* **EP&E 478a / PHIL 450a, The Problem of Evil** Keith DeRose and Miroslav Volf
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 480b / PHIL 465b, Recent Work in Ethical Theory** Stephen Darwall
A study of recently published works on ethics and its foundations. Issues include the grounds of normativity and rightness and the role of the virtues. HU

Ethnicity, Race, & Migration (ER&M)

* **ER&M 081b / MUSI 081b / SOCY 081b, 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. Pre-registration required: see under First Year Seminar Program. SO

* **ER&M 095a / AMST 095a / SAST 061a / THST 095a, South Asian American Theater and Performance** Shilarna Stokes

South Asian Americans have appeared on U.S. stages since the late nineteenth century, yet only in the last quarter century have plays and performances by South Asian Americans begun to dismantle dominant cultural representations of South Asian and South Asian American communities and to imagine new ways of belonging. This seminar introduces you to contemporary works of performance (plays, stand-up sets, multimedia events, and more) written and created by U.S.-based artists of South Asian descent as well as artists of the South Asian diaspora whose works have had an impact on U.S. audiences. With awareness that the South Asian American diaspora comprises multiple, contested, and contingent identities, we investigate how artists have worked to manifest complex representations of South Asian Americans onstage, challenge institutional and professional norms, and navigate the perils and pleasures of becoming visible. HU

ER&M 127a / EVST 127a / SOCY 127a / WGSS 127a, Health and Illness in Social**Context** Alka Menon

Present-day medicine and health care provide solutions to an ever-increasing array of human problems. Yet the achievement of health can be elusive. This course provides a broad introduction to the domains of health and illness in the U.S., with some coverage of international trends and topics. Students analyze how our personal health and public health are shaped by social structures, political struggles, expert knowledge, and medical markets. Topics include the cultural and social meanings associated with health and illness; inequalities in health and health care access and provision; controversies surrounding healthcare, medical knowledge production, and medical decision-making; and the social institutions of the health care industry. None so

ER&M 187b / AMST 133b / HIST 107b, Introduction to American Indian History

Ned Blackhawk

Survey of American Indian history, beginning with creation traditions and migration theories and continuing to the present day. Focus on American Indian nations whose homelands are located within the contemporary United States. Complexity and change within American Indian societies, with emphasis on creative adaptations to changing historical circumstances. HU

ER&M 200a, Introduction to Ethnicity, Race, and Migration Alicia Schmidt

Camacho

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

ER&M 206b / PLSC 437b / SOCY 223b, The Politics of Ethnic and National Identity

Maria Jose Hierro

Introduction to the study of ethnic and national identity, their determinants and consequences in comparative perspective. SO

*** ER&M 207b / LING 107b, Linguistic Diversity and Endangerment** Joshua Phillips

Introduction to the complexity of the question "How many languages are there in the world?" Geographical and historical survey of the world's languages; consideration of the ways in which languages can differ from one another. Language endangerment and the threat to world linguistic diversity it poses. Language reclamation and revitalization. None

ER&M 217b / AMST 284b, Introduction to Latinx Studies Albert Laguna

Themes and issues that have shaped the experiences of Latino/a populations in the United States explored within an interdisciplinary and hemispheric framework. Relations between the United States and Latin America; the history of ethnic labels; the formation of transnational communities and identities; the politics of language and bilingualism; race, class, and ethnicity; and gender and sexuality. HU

ER&M 219a / HIST 219a / JDST 200a / MMES 149a / RLST 148a, Jewish History and Thought to 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

ER&M 223b / AMST 209b / PLSC 262b, Race, Politics, and the Law Daniel HoSang
Examination of how race—as a mode of domination and resistance—has developed and transformed in the United States since the early-twentieth-century. How political actors and social movements engage the law to shape visions of freedom, democracy, and political life. Consideration of critical race theory, political discourse analysis, intersectionality and women of color feminism, and American political development. SO

ER&M 226a / AFAM 196a / AMST 196a / EVST 196a / SOCY 190a, Race, Class, and Gender in American Cities Laura Barraclough
Examination of how racial, gender, and class inequalities have been built, sustained, and challenged in American cities. Focus on the twentieth and twenty-first centuries. Topics include industrialization and deindustrialization, segregation, gendered public/private split, gentrification, transit equity, environmental justice, food access, and the relationships between public space, democracy, and community wellbeing. Includes field projects in New Haven. SO

ER&M 238a / AFAM 192a / AFST 238a / AMST 238a, Third World Studies Gary Okihiro
Introduction to the historical and contemporary theories and articulations of Third World studies (comparative ethnic studies) as an academic field and practice. Consideration of subject matters; methodologies and theories; literatures; and practitioners and institutional arrangements. SO

ER&M 249a / AFAM 118a / PSYC 336a / SOCY 153a, Is That Racist?: Theory and Methods for Diagnosing and Demonstrating Racism Phillip Atiba Goff
How do we know when something is racist? And how do we prove it to those who are skeptical? This course is designed to allow students to go beyond armchair pontificating about racism by exploring a broad range of ways social theorists have defined the term and methods they have used to demonstrate it. Together, we have the opportunity to read, critique, and synthesize scholarship from across disciplines, with the goal of refining our own definition of the term. To accomplish this, we examine the stakes of calling something racist, who benefits and who suffers from a given definition, and how racism functions across contexts (mostly) within the United States. We also learn about popular methods for demonstrating that an idea, feeling, behavior, person, or institution is racist and evaluate how evidence about racism (or lack thereof) can obscure a diagnosis of racism—or lead to an erroneous one. Throughout the course, we take opportunities to translate the theoretical and methodological lessons we learn to the world we live in today, from popular culture to dinner table conversations. While there are no statistical prerequisites, students will be asked to think about the logic of statistical analysis and should be comfortable reasoning about numbers. HU, SO

ER&M 263b / HIST 264b / RSEE 268b, Eastern Europe since 1914 Timothy Snyder
Eastern Europe from the collapse of the old imperial order to the enlargement of the European Union. Main themes include world war, nationalism, fascism, and communism. Special attention to the structural weaknesses of interwar nation-states and postwar communist regimes. Nazi and Soviet occupation as an age of extremes.

The collapse of communism. Communism after 1989 and the dissolution of Yugoslavia in the 1990s as parallel European trajectories. HU

ER&M 264a / AMST 134a / SOCY 134a / WGSS 110a, Sex and Gender in Society

Rene Almeling

Introduction to the social processes through which people are categorized in terms of sex and gender, and how these social processes shape individual experiences of the world. Sex and gender in relation to race/ethnicity, class, sexuality, nationality, education, work, family, reproduction, and health. SO

*** ER&M 279a / HIST 295Ja / HUMS 286a / PHIL 433a, Mass Incarceration in the Soviet Union and the United States** Timothy Snyder and Jason Stanley

The Franke Seminar. An investigation of the experience and purposes of mass incarceration in the Soviet Union and the United States in the twentieth century. Incarceration is central to the understanding, if not usually to the self-understanding, of a society. It is thus a crucial aperture into basic questions of values and practices. This course proposes a frontal approach to the subject, by investigating two of the major carceral systems of the twentieth century, the Soviet and the American. Intensive reading includes first-person accounts of the Gulag and American prison as well as scholarly monographs on the causes of mass incarceration in different contexts. Brief account is taken of important comparative cases, such as Nazi Germany and communist China. Guest lectures and guest appearances are an important element of our teaching. HU

ER&M 282a / AMST 272a / HIST 183a / WGSS 272a, Asian American History, 1800 to the Present Mary Lui

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

*** ER&M 291a / AFAM 352a / AMST 438a / LITR 295a / WGSS 343a, Caribbean Diasporic Literature** Fadila Habchi

An examination of contemporary literature written by Caribbean writers who have migrated to, or who journey between, different countries around the Atlantic rim. Focus on literature written in English in the twentieth and twenty-first centuries, both fiction and nonfiction. Writers include Caryl Phillips, Nalo Hopkinson, and Jamaica Kincaid. HU

*** ER&M 292a / AFAM 239a / AMST 461a / EDST 209a / WGSS 202a, 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. WR, HU

*** ER&M 293b / LAST 293b, History and Culture of Cuba** Albert Laguna

Investigation of the history and culture of Cuba from the colonial period to the present. Cultural production in the form of film, literature, and music discussed in relation to

aesthetics and historical context. The course also engages with the history and culture of Cuban communities in the United States. HU

ER&M 299b / AMST 299b / HIST 166b, The History of Right Now Matthew Jacobson

Historiographic narrative of United States history over the past century and critical/methodological practices of thinking historically and of identifying ways in which our present has been conditioned by historical legacies, both momentous and subtle. Topics include the New Deal, WWII, the arms race, Reaganomics, and 9/11 in terms of their lasting influence on American conditions in the present. HU RP

* **ER&M 300a or b, Comparative Ethnic Studies** Staff

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 310a / AFAM 326a / AMST 312a / WGSS 298a, Postcolonial Cities of the West** Fadila Habchi

Examination of various texts and films pertaining to the representation of postcolonial cities in the global north and a range of social, political, and cultural issues that concern those who inhabit these spaces. HU

* **ER&M 314b / AMST 314b / WGSS 306b, Gender and Transgender** Greta LaFleur

Introduction to transgender studies, an emergent field that draws on gender studies, queer theory, sociology, feminist science studies, literary studies, and history. Representations of gender nonconformity in a cultural context dominated by a two-sex model of human gender differentiation. Sources include novels, autobiographies, films, and philosophy and criticism. RP

* **ER&M 323b, Documenting Refugees in New Haven** Quan Tran

This hands-on mixed methods seminar explores the historical and contemporary experiences of refugees in New Haven. The course examines the historical contexts that have led to the resettlements of different refugee populations in New Haven as well as contemporary issues concerning these communities. Through workshops, students gain qualitative research skills by exploring oral history, archival research, and ethnographic participant observation as complementary methods to document and study refugee communities in New Haven. The course also attends to questions of representation, ethics, power dynamics, and knowledge production in documenting and studying underrepresented and vulnerable communities. HU, SO

* **ER&M 333b, Mexico and the Migratory Lyric** David Francis

What is a lyric and how does it move? How have understandings of Mexican poetry changed over the course of the nation's history, and what factors have contributed to these changes? To investigate these questions, this course examines how different forms of lyrical communication have been disseminated within Mexico and internationally. Therein, we discuss how lyrical production has been complicated by such issues as print culture and the publication industry; race, gender, class, and economics; and cultural politics and political representation. Our explorations begin with the popular *corrido* in women's revolutionary war songs. Then move to discussions of nationality, translation, and bilingual anthology production before and after the rise of boom literature; border

writing, migration, and the formation of multilingual literary communities; discourse of gender, sexuality, race, and disease; and the popularization of narco-ballads. We conclude by discussing the contemporary lyric as seen in different media like the novel and the film industry. HU

*** ER&M 335b / FREN 416b / WGSS 416b, Social Mobility and Migration** Morgane Cadieu

Exploration of mobility in the French social landscape and its representations in contemporary French and Francophone texts and films; the intersectionality of class, race, gender, and sexuality; emancipation, migration, demotion, and precarity; labor and the workplace; the interaction between social class and literary style. Works by: Angot, Eribon, Ernaux, Kechiche, Louis, Mukasonga, NDiaye, Taïa. Theoretical excerpts by: Berlant, Bourdieu, Delphy, Fraser, Ranci re, Piketty. Students have the possibility to put the corpus in dialogue with the literature of other countries. L5, HU

*** ER&M 339b / AFAM 348b / AMST 388b / WGSS 332b, James Baldwin 1964-1987: Transnationalism, Exile & Intimacy** Leah Mirakhor

The course explores Baldwin's oeuvre since 1964 until his death in 1987. As critics have noted, there has been a renaissance regarding the work of James Baldwin since 1999, with scholarly publications devoted to his work, public tributes, films, and publications of previously uncollected or out of print works. Critics had hailed Baldwin's earlier works—*Go Tell It on the Mountain*, *Giovanni's Room*, *Notes of a Native Son*—as his greatest literary accomplishments. After Baldwin's most celebrated work—*The Fire Next Time*—Baldwin appeared on the cover of *Time* magazine in 1963, under the heading "Birmingham and Beyond: The Negro's Push for Equality." In this moment, Baldwin became a celebrated public figure in the U.S. and beyond. Our class investigates the period after this height of celebrity, when critics lambasted him for being too political, too angry, too bitter, and losing narrative control and rigor. This two-decade span is significant because Baldwin was witness to the deaths and incarceration of Civil Rights leaders (whom he mourned as friends), the increased surveillance and incarceration of black activists, the Vietnam war, the emergence of Black Power, feminist movements, and gay and queer liberations. During this time, Baldwin lived primarily in Turkey and France, and continued to travel globally. Baldwin's essays, novels, speeches, and poetry wrestled with how to formally capture and witness the violences of imperialism, homophobia, and racism. Since his death, Baldwin's work has continued to influence and inform theoretical insights in American studies, literary studies, Black studies, and queer studies. Our class engages with Baldwin's formal practices, political contexts, and critical interpretations across these fields. Preference given to students with a background in African American Studies, WGGSS, ERM, and American Studies. Previous readings of James Baldwin's works recommended but not required. HU

*** ER&M 349a / AFAM 227a / AMST 227a / HIST 137Ja, From the Voting Rights Act to #blacklivesmatter** Ferentz Lafargue

This course explores the period beginning from 1964 through the emergence of the #blacklivesmatter movement in 2013. Key concepts covered in this course include the Black Panther Party and rise of the Black Power movement; political campaigns of Shirley Chisholm, Jesse Jackson, and Barack Obama. The seminar concludes with an examination of the #blacklivesmatter movement and broader efforts addressing mass incarceration, poverty, and opportunity gaps in education. HU

* **ER&M 351b, Southeast Asian Refugee Histories and Experiences** Quan Tran

This multi-disciplinary seminar explores the historical and contemporary experiences of Southeast Asian refugees living in the United States. The course examines the historical contexts that created Southeast Asian refugee diasporas and community formations in the US as well as contemporary social, political, cultural, and economic issues concerning these communities. Organized thematically, this course is comparative in scope as it addresses topics such as: colonialism, imperialism, war, nation-building, global capitalism, migration experiences, resettlement, intergenerational dynamics, interracial/ethnic relations, and knowledge and cultural production. HU, SO

* **ER&M 359a or b / HIST 345Ja or b, Gender and the State in Latin America and the Caribbean** Staff

This seminar offers an introduction to historical constructions of gender identity and gendered politics in Latin America and the Caribbean from pre-colonial native societies into the twentieth century. We begin with an analysis of gender in the Inca empire and several lowland societies, focusing on spirituality, agriculture, and land tenure particularly. The arrival of Spanish colonialism brings tremendous and complex transformations to the societies that we consider; we analyze discourses of honor, as well as how various subjects navigated the violence and the transforming colonial state. Our readings turn to Caribbean slavery, where studies of gendered experiences of enslavement and resistance have grown considerably in recent decades. Building on these insights, we analyze the gendered experiences of abolition and inclusion into contentious new Latin American and Caribbean nations of the nineteenth century. In the twentieth century, we consider some of the most salient analyses of the growth of state power, including dictatorships, in multiple sites. Throughout we maintain an eye for principle questions about representation, reproduction, inclusion, political consciousness, sexuality, migration, kinship, and revolutionary struggle through a gendered lens. WR, HU

* **ER&M 360b / HLTH 370b / HSHM 432b / SOCY 390b / WGSS 390b, Politics of Reproduction** Rene Almeling

Reproduction as a process that is simultaneously biological and social, involving male and female bodies, family formation, and powerful social institutions such as medicine, law, and the marketplace. Sociological research on reproductive topics such as pregnancy, birth, abortion, contraception, infertility, reproductive technology, and aging. Core sociological concepts used to examine how the politics of reproduction are shaped by the intersecting inequalities of gender, race, class, and sexuality. WR, SO

* **ER&M 367b / AMST 447b / EDST 270b, Contemporary Native American K-12 and Postsecondary Educational Policy** Matthew Makomenaw

This course will explore current 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 110 recommended SO

* **ER&M 381b / AMST 348b / EVST 304b, Space, Place, and Landscape** Laura Barraclough

Survey of core concepts in cultural geography and spatial theory. Ways in which the organization, use, and representation of physical spaces produce power dynamics related to colonialism, race, gender, class, and migrant status. Multiple meanings of home; the politics of place names; effects of tourism; the aesthetics and politics of map making; spatial strategies of conquest. Includes field projects in New Haven. SO

* **ER&M 382a / AMST 301a / HIST 325Ja, Researching Mexican American Histories** Stephen Pitti

A survey of recent scholarship on Mexican American history. Students write a research paper based on primary sources and explore issues related to migration, education, detention, religion, urban communities, ethnic politics, and youth activism since the mid-nineteenth century. Reading knowledge of Spanish preferred. HU

* **ER&M 384a / HSAR 487a, Art in the Anthropocene** Staff

There is widespread consensus that we are living in a state of emergency and ecological collapse. This seminar explores how contemporary artists are responding to the Anthropocene, a geological epoch defined by the impacts of human activity on the natural world. The converging crises of our present have revealed how structural inequality has created an uneven distribution of environmental risk along the lines of class, ethnicity, gender, and race. Engaging critical issues in the environmental humanities and focusing on the intersections of environmental and social justice, the course focuses on contemporary art from the 1970s to the present, with attention to how the legacies of colonization, empire, and the transatlantic slave trade shape the present. We consider how art bears witness to ecological crisis while exploring how arts worldmaking potential might help us imagine more just futures. Through a survey of contemporary art in the Anthropocene, we critically examine the interface between art, activism, and knowledge production. The course includes object-based study at the Yale Center for British Art, the Yale University Gallery, the Medical Historical Library and the Beinecke Library (dependent on Covid-19 policies). HU

* **ER&M 385a / AFAM 401a / AMST 411a / FILM 453a, Introduction to Documentary Studies** Matthew Jacobson

An introduction to documentary film, photography, and radio for students interested in doing documentary work, as well as for those who simply wish to study the history of the documentary as a cultural form. HU RP

* **ER&M 394a / ANTH 409a / EVST 422a / F&ES 422a / GBL 394a, Climate and Society from Past to Present** Michael Dove

Discussion of the major currents of thought – both historic and contemporary – regarding climate, climate change, and society; focusing on the politics of knowledge and belief vs disbelief; and drawing on the social sciences and anthropology in particular. WR, SO

* **ER&M 401a or b, Writer/Rioter: Public Writing in the 21st Century** Leah Mirakhor

In his collection *Lunch with A Bigot: The Writer in the World*, Amitava Kumar asks “What divides the writer from the rioter?” This class is concerned with unpacking the various ways writers participate in the 21st century world as disturbers of the peace. This century has seen great advances in technology, health, alternative energies, new

forms of communication, but also vast consolidations of power, mass incarceration, climate change, poverty, homelessness, wars, state surveillance, and sexual violence. Our current historical moment increasingly asks us to craft broader and deeper connections between personal, local, national, and international issues. This course explores cultural criticism on a range of issues that examine the intersections of history, politics, media, and various crises in the 21st century by writers from a variety of backgrounds: journalists, academics, activists, artists, scientists, and politicians. We analyze how these writers use their professional expertise to craft work for the public arena, and what it means to create a history of the present. The course's four sections cover various responses to some of the issues most publicly contested across college campuses nationwide, and here at Yale: racial unrest, sexual assault, climate change, poverty, incarceration, fascism, and gun violence. HU

* **ER&M 402a / AFAM 459a / AMST 479a, The Displaced: Migrant and Refugee Narratives of the 20th and 21st Centuries** Leah Mirakhor

This course examines a series of transnational literary texts and films that illuminate how the displaced—migrants, exiles, and refugees—remake home away from their native countries. The twentieth and twenty-first centuries have produced massive displacements due to wars, genocides, racial, ethnic and religious conflicts, economic and climate change, among other factors. Our course focuses on several texts that explore questions of home, nation, and self in the context of specific historical events such as the Holocaust, civil rights movements in the U.S., internment, the Indian partition, African decolonization, and Middle Eastern/Arab ethno-religious conflicts and wars. We examine these events alongside the shifting legal and political policies and categories related to asylum, humanitarian parole, refugee, and illegal alien status. Exploring themes such as nostalgia, longing, trauma, and memory, we look at the possibilities and limitations of creating, contesting, and imagining home in the diaspora. Our objective is to debate and develop the ethical, political, geographic, and imaginative articulations of home in an era of mass displacements and geo-political crises. We examine how notions of home are imagined alongside and against categories of race, gender, and sexuality. HU

* **ER&M 405a / AMST 484a / FILM 402a / HSAR 493a / WGSS 462a, Visual Kinship, Families, and Photography** Laura Wexler

Exploration of the history and practice of family photography from an interdisciplinary perspective. Study of family photographs from the analog to the digital era, from snapshots to portraits, and from instrumental images to art exhibitions. Particular attention to the ways in which family photographs have helped establish gendered and racial hierarchies and examination of recent ways of reconceiving these images. HU

* **ER&M 408a / AFAM 412a / AMST 408a / THST 459a, Race and Comedy** Albert Laguna

Introduction to theories of the ludic and to critical race theory. Ways in which comic modes have been utilized by racialized subjects to represent and issue critiques of the dominant culture. Analysis of stand-up comedy, film, television, and novels. HU

* **ER&M 409a / AMST 345a / WGSS 408a, Latinx Ethnography** Ana Ramos-Zayas

Consideration of ethnography within the genealogy and intellectual traditions of Latinx Studies. Topics include: questions of knowledge production and epistemological traditions in Latin America and U.S. Latino communities; conceptions of migration, transnationalism, and space; perspectives on "(il)legality" and criminalization; labor,

wealth, and class identities; contextual understandings of gender and sexuality; theorizations of affect and intimate lives; and the politics of race and inequality under white liberalism and conservatism in the United States. SO

* **ER&M 412a / PSYC 312a, Native American Health** Christopher Cutter and Mark Beitel

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 435b / AMST 422b / HIST 151Jb, Writing Tribal Histories** Ned Blackhawk

Historical overview of American Indian tribal communities, particularly since the creation of the United States. Challenges of working with oral histories, government documents, and missionary records. WR, HU

* **ER&M 438b / AFAM 455b / EDST 340b, Anti-Racist Curriculum and Pedagogy**
Daniel HoSang

This seminar explores the pedagogical and conceptual tools, resources and frameworks used to teach about race and racism at the primary and secondary levels, across diverse disciplines and subject areas. Moving beyond the more limited paradigms of racial colorblindness and diversity, the seminar introduces curricular strategies for centering race and racism in ways that are accessible to students from a broad range of backgrounds, and that work to advance the overall goals of the curriculum. Prerequisite: ER&M 200 or an equivalent course addressing histories of race, ethnicity, and migration. SO

* **ER&M 439a / AMST 439a, Fruits of Empire** Gary Okihiro

Readings, discussions, and research on imperialism and "green gold" and their consequences for the imperial powers and their colonies and neo-colonies. Spatially conceived as a world-system that enmeshes the planet and as earth's latitudes that divide the temperate from the tropical zones, imperialism as discourse and material relations is this seminar's focus together with its implantations—an empire of plants. Vast plantations of sugar, cotton, tea, coffee, bananas, and pineapples occupy land cultivated by native and migrant workers, and their fruits move from the tropical to the temperate zones, impoverishing the periphery while profiting the core. Fruits of Empire, thus, implicates power and the social formation of race, gender, sexuality, class, and nation. HU, SO

* **ER&M 441a / LITR 335a / PORT 341a, Crossing Cultures in the Portuguese Diaspora** Kenneth David Jackson

Inquiry into the first encounters of the Portuguese with the people and cultures of Africa, Asia, and Brazil after the voyage of Vasco da Gama (1497-99). Topics include acculturation, contact peoples and languages, creolistics and hybrid cultures, music, plants and cuisines, and the theory of space in between cultures. Readings include the epic, histories, memoirs, and travel literature, and the "Cannibal Manifesto." Reading knowledge of Portuguese suggested. WR, HU

* **ER&M 452b / AMST 452b, Movement, Memory, and U.S. Settler Colonialism**

Laura Barraclough

This research seminar examines and theorizes the significance of movement and mobility in the production and contestation of settler colonial nation-states. To do so, it brings together the fields of settler colonial studies, critical indigenous studies, ethnic studies, public history, and mobility studies. After acquainting ourselves with the foundations and some of the key debates within each of these fields, we examine four case studies: The Freedom Trail and the Black Heritage Trail in Boston; the Lewis and Clark expedition and its recuperation as a site of healing and education for tribal nations in the Upper Midwest and Northwest; the Trail of Tears and the contest over southern memory; and the relationships between settlement, labor migration, and regional racial formation in California. Students then conduct their own research projects that integrate primary source research on a particular organized movement (of people, non-human animals, ideas, practices) with two or more expressions of memory about that movement (in the form of public history installations, popular culture, literature, music, digital memes, etc.). This course is best suited to students who have initial ideas about a potential research topic and are exploring related ideas for their senior essay. HU

* **ER&M 462b / AMST 462b / WGSS 463b, The Study of Privilege in the Americas**

Ana Ramos-Zayas

Examination of inequality, not only through experiences of the poor and marginal, but also through institutions, beliefs, social norms, and everyday practices of the privileged. Topics include: critical examination of key concepts like “studying up,” “elite,” and “privilege,” as well as variations in forms of capital; institutional sites of privilege (elite prep schools, Wall Street); living spaces and social networks (gated communities, private clubs); privilege in intersectional contexts (privilege and race, class, and gender); and everyday practices of intimacy and affect that characterize, solidify, and promote privilege. SO

* **ER&M 491a, The Senior Colloquium: Theoretical and Methodological Issues**

Quan Tran

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 492b, The Senior Essay or Project** Ana Ramos-Zayas

Independent research on a one-term senior essay or project.

Film and Media Studies (FILM)

* **FILM 021a / AMST 021a, Sports and Media** Charles Musser

This course develops critical thinking about sports in contemporary media culture. The social aspect of playing, watching, and talking about sports has always involved media; media likewise inflect the meaning of athletic events. “Media” here designates cinema, television, radio, print, and social media. We analyze the ways mass media and sports have shaped identity: gender, race, class, age, geography, and ideology. The background for considering these social phenomena is a general understanding of the commercial and civic nature of major sports, although some attention is also paid to amateur media and alternative sports. Our scope extends from the U.S. toward the

globe, observing how international networks (Olympics, World Cup) act in specific national cultures. Principal readings are drawn from recent scholarship on sports and media, and criticism of films. Historically significant and contemporary films introduce the history of sports in media culture, from the *Corbett-Courtney Fight* (1894) to *Rocky*, *Paper Lion*, *The Armstrong Lie*, *Invictus*, *Venus and Serena*, and *Chariots of Fire*. Classroom activities include mini-lectures, discussion, group analysis of texts, and brief student presentations. WR, HU

FILM 150a, Introduction to Film Studies John MacKay

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

FILM 160b / ENGL 196b, Introduction to Media John Peters

Introduction to the long history of media as understood in classical and foundational (and even more recent experimental) theories. Topics involve the technologies of modernity, reproduction, and commodity, as well as questions regarding knowledge, representation, public spheres, and spectatorship. Special attention given to philosophies of language, visibility, and the environment, including how digital culture continues to shape these realms. WR, HU

* **FILM 161a / ART 241a, Introductory Film Writing and Directing** Jonathan Andrews

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. Course fee charged per term. RP

* **FILM 162a or b / ART 142a or b, Introductory Documentary Filmmaking** A.L. Steiner

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." Course fee charged per term. RP

FILM 232b, Classical Hollywood Narrative 1920–1960 Camille Thomasson

Survey of Classical Hollywood films. Topics include history of the studio system; origin and development of genres; the film classics of the Classical Hollywood period, and the producers, screenwriters, directors, and cinematographers who created them. WR, HU

* **FILM 246a / AFAM 246a / THST 249a, Introduction to African American Cinema** Nicholas Forster

This course examines the history of African American cinema from the turn of the twentieth century through the present. In recent years, there has been a growing sense that, after decades of unequal hiring practices, black filmmakers have carved a space for artistic creation within Hollywood. This feeling was emboldened when Ryan Coogler's *Black Panther* became the highest grossing film of the 2018, seemingly heralding a new age of black-authored and black-focused cinema. This course examines the long history of black cinema that led to the financial and critical success of filmmakers like Coogler,

Ava DuVernay, and Jordan Peele. In this course, we survey the expansive work of black American cinema and ask: is there such a category as black film/cinema? If so, is that category based on the director, the actor, the subject matter or ideology of the film? What political, aesthetic, social, and personal value does the category of black film/cinema offer? Some of the filmmakers include Barry Jenkins, Kathleen Collins, Spike Lee, Julie Dash,, Oscar Micheaux, Ava Duvernay, and Charles Burnett. HU

* **FILM 289a / ENGL 299a, Nineteenth-Century Media (as/and Literature)** John Peters

In the nineteenth century it is as if someone poured Miracle-Gro on the technological world. This class studies nineteenth-century media and their imaginative consequences. It follows a broad definition of media as material apparatuses that record, transmit, and process the world. Steam, photography, telegraphy, sound-recording, and cinema were only some of the ways people found their worlds disrupted, both excitingly and distressingly. Literature is, of course, itself a medium, and as a first-rate archive of media history it serves as our chief, but not exclusive, entry-point. Readings include works of literature, recent scholarship, and primary documents or artifacts from the arts and sciences. We may look at paintings, pianos, and weather reports as well as telegrams, photographs, and séances. We work within a long nineteenth century (1789-1914) though mostly focus on the 1830s to 1890s. Our geographical center of gravity is the the UK and US, with occasional side trips to the continent. Questions of empire of course take us elsewhere, and final essays on areas beyond the Anglophone world are welcome. Helpful but not required prerequisites for the class include ENGL 126, 127, 128, and FILM 160. WR, HU

* **FILM 304a / EALL 281a, Japanese Cinema and Its Others** Aaron Gerow
Critical inquiry into the myth of a homogeneous Japan through analysis of how Japanese film and media historically represents “others” of different races, ethnicities, nationalities, genders, and sexualities, including women, black residents, ethnic Koreans, Okinawans, Ainu, undocumented immigrants, LGBTQ minorities, the disabled, youth, and monstrous others like ghosts. HU

FILM 305a / LITR 361a, Animation: Disney and Beyond Aaron Gerow
Survey of the history of animation, considering both its aesthetics and its social potentials. The focus is on Disney and its many alternatives, with examples from around the world, from various traditions, and from different periods. HU

* **FILM 319a / GMAN 273a / LITR 368a, The Third Reich in Postwar German Film, 1945 to Present** Jan Hagens

Close study of the intersection of aesthetics and ethics with regard to how German films, since 1945, have dealt with Nazi history. Through the study of German-language films (with subtitles), produced in postwar East, West, and unified Germany, students consider and challenge perspectives on the Third Reich and postwar Germany, while learning basic categories of film studies. HU

* **FILM 320b / HSAR 490b, Close Analysis of Film** Oksana Chefranova

Close study of a range of major films from a variety of periods and places. Apart from developing tools for the close analysis of film, we consider such topics as genre and mode; the role of sound; cinema as a structure of gazes; remakes and adaptations; approaches to realism; narration and resistance to narration; film in relation to

other moving image media; and the relationship of close analysis to historical contextualization and interpretation more generally. Prerequisite: FILM 150. HU

* **FILM 329a / AFAM 331a / THST 332a, Black Film and Theatre** Nicholas Forster
This course examines the numerous connections, networks, and associations between black film and black theatre across the latter half of the twentieth century. While there has been a resurgence of interest in black theatre on and off Broadway in recent years, we look at critical works created by black writers who created spaces, slid into the cracks, and opened wide the chasms of possibility between cinema and drama. We ask: how have black artists used these two mediums to articulate a political consciousness? How have black writers built, ruptured, and amended the demands required by cultural institutions like Broadway and Hollywood? We investigate the tensions between ideas of the universal and the specific, all the while attending to the complex and complicated possibilities across two different mediums: cinema and the stage. The question of authorship in the move from stage to screen will be omnipresent as we ask what kinds of performances are possible and what new worlds can be created in those transitions?
WR, HU

* **FILM 330a, 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 333b / LITR 351b, Early Film Theory and Modernity Francesco Casetti
Introduction to film theory from its beginnings to c. 1930, including its emphasis on the spectator's experience. Ways in which early theory highlighted characteristics of modern life such as speed, economy, contingency, and excitation. The role of national identity in defining topics of theoretical research explored through comparison of American and European debates. HU

* **FILM 336a / MMES 311a / RLST 256a, Social Change in Middle East Cinemas** Staff
This course invites students to explore how modern aesthetic forms such as cinemas from the Middle East and North Africa critique rigid social realities and imagine modern social experiences, thereby pushing boundaries towards social change. By chronologically examining Arabic, Turkish, Hebrew, and Persian films in different historical periods, we will explore how film as art reveals the nature of social myth and the role public intellectuals play in perpetuating or challenging that myth. In addition to weekly film screenings (with English subtitles), course material includes short readings on the modern history of the region, history of film production, and analysis of film as art. By the end of this course, students will learn about the history of filmmaking in the MENA region, the different questions (religion, class, language, gender, ethnicity, race, nationalism and colonialism) influencing the production and reception of film, the challenges facing the filmmaker as an artist and producer and more importantly how these challenges impact the imagination of social change on the screen.

* **FILM 338a, The International Movie Musical** John MacKay

A seminar devoted to movie musicals from around the world and across nearly a century of cinema history. We watch films from France, the USSR, Mexico, Senegal, India, Egypt, the PRC, the USA and other countries, and by such directors as King Vidor, Jacques Demy, Youssef Chahine, Carlos Saura, and Agnès Varda. Topics to be discussed include the relationship of the musical to earlier musical theatrical forms like opera and vaudeville; the formal problems of integrating narrative with musical and choreographed spectacle; and the relationship of the musical to questions of gender, ethnicity, race and nationhood. Weekly film screenings. HU

* **FILM 341a / MGRK 238a / WGSS 233a, 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. None HU

* **FILM 348b / ART 385b / THST 400b, Performance and the Moving Image** Emily Coates and Joan MacIntosh

The boundaries between live and mediated performance explored through the creation of an original work that draws on methods in experimental theater, dance, and video art. Questions concerning live versus mediated bodies, the multiplication of time, space, and perspective through technology, and the development of moving images. The final production includes both a live performance and an art video. Application deadline January 5, 2018. Contact the instructors for more information. Open to students of all levels and majors. WR, HU

* **FILM 349b / HMRT 369 / LAST 369b / LITR 369b, Gender Politics in Latin American Cinema** Moira Fradinger

Introduction to the contemporary politics of gender in Latin American cinema, with review of films from Argentina, Brazil, Colombia, Chile, Peru, Paraguay, Guatemala, Cuba, Venezuela and Mexico, and emphasis on how gender has been represented in a region with massive gender debates developing from the 1980s onwards. Topics include: discourses of human rights; representations of gay, transgender and intersex questions; social and economic status of women and feminized bodies; migration and indigenous peoples. Seminar is conducted in Spanish. Prerequisite: Level of L4. L5, HU

* **FILM 350a or b, Screenwriting** Marc Lapadula

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 freshmen.

FILM 355b / ART 341b, 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. Course fee charged per term. Enrollment limited to 8. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 241. RP

FILM 356b / ART 342b, Intermediate Documentary Filmmaking Michel Auder
 Students explore the storytelling potential of the film medium by making documentary art. 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 using examples of students' work. Exercises in storytelling principles. Course fee charged per term. Limited enrollment. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 141 or 142, and FILM 150. HU RP

* **FILM 360a / LITR 301a / RSEE 380a / RUSS 380a, Putin's Russia and Protest Culture** Marijeta Bozovic
 Survey of Russian literature and culture since the fall of communism. The chaos of the 1990s; the solidification of power in Putin's Russia; the recent rise of protest culture. Sources include literature, film, and performances by art collectives. Readings and discussion in English; texts available in Russian. WR, HU

* **FILM 363a / LAST 360a / LITR 360a, Radical Cinemas of Latin America** Moira Fradinger
 Introduction to Latin American cinema, with an emphasis on post-World War II films produced in Cuba, Argentina, Brazil, and Mexico. Examination of each film in its historical and aesthetic aspects, and in light of questions concerning national cinema and "third cinema." Examples from both pre-1945 and contemporary films. Conducted in English; knowledge of Spanish and Portuguese helpful but not required. HU

* **FILM 366a / ITAL 306a, Spotlight on Sicily in Literature and Film** Millicent Marcus
 Sicily has always occupied a privileged place in the Italian imagination. The course focuses on a series of fictional works and films#from the early 20th century until today#which reveal how this island has served as a vital space for cinematic experimentation and artistic self-discovery. Topics range from unification history, the Mafia, the migrant crisis, environmental issues, gender, and social/sexual mores. The course is taught in English, but those who wish to enroll for credit towards the certificate in Italian, or the major, can make arrangements to do so. WR, HU

* **FILM 395b, Intermediate Screenwriting** Marc Lapadula
 A workshop in writing short screenplays. Frequent revisions of each student's script focus on uniting narrative, well-delineated characters, dramatic action, tone, and dialogue into a polished final screenplay. Prerequisite: FILM 350. Priority to majors in Film & Media Studies.

* **FILM 397b / ENGL 423b / THST 228b, Writing about the Performing Arts**
 Margaret Spillane
 Introduction to journalistic reporting on performances as current events, with attention to writing in newspapers, magazines, and the blogosphere. The idea of the audience

explored in relation to both a live act or screening and a piece of writing about such an event. Students attend screenings and live professional performances of plays, music concerts, and dance events. Formerly ENGL 244. WR, HU

* **FILM 401b / ENGL 462b / THST 453b, Writing Screenplay Adaptations** Donald Margulies

A workshop on the art of screenplay adaptation. Students read short stories, novels, and non-fiction; the screenplays based on that source material; and view and analyze the final product, the films themselves. Instruction focuses on the form, economy, and structure specific to screenwriting. Weekly writing exercises supplement the creation of a final project: a short screenplay based on source material of the student's choosing.

Previous experience in writing for film or stage would be advantageous but is not required. Restricted to juniors and seniors, or by permission of the instructor. HU

* **FILM 402a / AMST 484a / ER&M 405a / HSAR 493a / WGSS 462a, Visual Kinship, Families, and Photography** Laura Wexler

Exploration of the history and practice of family photography from an interdisciplinary perspective. Study of family photographs from the analog to the digital era, from snapshots to portraits, and from instrumental images to art exhibitions. Particular attention to the ways in which family photographs have helped establish gendered and racial hierarchies and examination of recent ways of reconceiving these images. HU

* **FILM 419a / GMAN 368a / LITR 382a, German New Waves in Cold War Europe** Katie Trumpener

Comparative study of New Wave cinema in East and West Germany, with a focus on aesthetic ferment, institutional barriers, and transformation. Berlin as the best place to follow Europe's emerging cinematic New Waves before 1961. Distinctive approaches developed by young filmmakers in East and West Germany to political and documentary filmmaking, to the Nazi past and the Cold War, and to class, gender, and social transformation. Knowledge of German helpful but not necessary. WR, HU

* **FILM 422a / EALL 290a / EAST 402a, Screening China from the Margins** Staff

This seminar challenges mainstream understandings of contemporary China by focusing on films concerned with the people who exist on its margins. The course is divided into three units: sexuality, socio-economic inequality, and ethnicity. Students are introduced to the terms of film analysis and of contemporary Chinese history and social issues. Films are drawn from China, Hong Kong, and Taiwan, and represent both major studio directors, such as Wang Kar-wai and Ang Lee, and independent directors, such as Pema Tseden and Jia Zhangke. Students have the option of creating short videos/films in lieu of certain written assignments. All films and readings are available in English. No previous knowledge of Chinese language or culture is required.

HU

* **FILM 429a / LITR 466a / RUSS 465a, War in Literature and Film** Katerina Clark

Representations of war in literature and film; reasons for changes over time in portrayals of war. Texts by Stendahl, Tolstoy, Juenger, Remarque, Malraux, and Vonnegut; films by Eisenstein, Tarkovsky, Joris Ivens, Coppola, Spielberg, and Altman.

HU

* **FILM 433a / AFAM 216a, Family Narratives/Cultural Shifts** Thomas Harris

This course looks at films that are redefining ideas around family and family narratives in relation to larger social movements. We focus on personal films by filmmakers who

consider themselves artists, activists, or agents of change but are united in their use of the nonfiction format to speak truth to power. In different ways, these films use media to build community and build family and ultimately, to build family albums and archives that future generations can use to build their own practices. Just as the family album seeks to unite people across time, space, and difference, the films and texts explored in this course are also journeys that culminate in linkages, helping us understand nuances of identity while illuminating personal relationships to larger cultural, social, and historical movements. HU

* **FILM 434b / AFAM 220b, Archive Aesthetics and Community Storytelling** Thomas Harris

This production course explores strategies of archive aesthetics and community storytelling in film and media. It allows students to create projects that draw from archives – including news sources, personal narratives, and found archives – to produce collaborative community storytelling. Conducted as a production workshop, the course explores the use of archives in constructing real and fictive narratives across a variety of disciplines, such as – participants create and develop autobiographies, biographies, or fiction-based projects, tailored to their own work in film/new media around Natalie Goldberg’s concept that “our lives are at once ordinary and mythical.” HU

* **FILM 453a / AFAM 401a / AMST 411a / ER&M 385a, Introduction to Documentary Studies** Matthew Jacobson

An introduction to documentary film, photography, and radio for students interested in doing documentary work, as well as for those who simply wish to study the history of the documentary as a cultural form. HU RP

* **FILM 455a / AMST 463a / EVST 463a / THST 457a, 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 457b / ITAL 303b / LITR 359b, Italian Film from Postwar to Postmodern** Millicent Marcus

A study of important Italian films from World War II to the present. Consideration of works that typify major directors and trends. Topics include neorealism, self-reflexivity and metacinema, fascism and war, and postmodernism. Films by Fellini, Antonioni, Rossellini, De Sica, Visconti, Pasolini, Bertolucci, Wertmuller, Tornatore, and Moretti. Films in Italian with English subtitles. WR, HU

* **FILM 470a, Women Filmmakers** Oksana Chefranova

The seminar surveys the extraordinary contributions that female filmmakers have made to cinema and to film theory, ranging from the beginning of cinema to the most recent examples, from narrative cinema to experimental practice. We examine films by Lois Weber, Alice Guy Blaché, Germaine Dulac, Leontine Sagan, Leni Riefenstahl, Dorothy Arzner, Ida Lupino, Maya Deren, Agnès Varda, Věra Chytilová, Barbara Hammer, Julie Dash, Claire Denis, Lucrecia Martel, Kelly Reichardt, Sofia Coppola, Alice Rohrwacher, Céline Sciamma, Ana Lily Amirpour, and Mati Diop. We read texts written by women writer, filmmakers, and critics such as Germaine Dulac, Maya Deren, Barbara Hammer, Julie Dash, Colette, Virginia Woolf, Laura Mulvey, and Manohla Dargis. The cinema is approached from a variety of historical and theoretical discourses such as production

history, feminism, world cinema, and post-colonial studies among others. There will be an option for a practical component that might include a curatorial project, an interview with a filmmaker, or an audio-visual essay (in consultation with the instructor). WR, HU

*** FILM 471a or b, Independent Directed Study** Staff

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 483a and FILM 484b / ART 442a and ART 443b, 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. Course fee charged per term. Enrollment limited to 8. Priority to majors in Art and in Film & Media Studies. Prerequisite: ART 341.

*** FILM 487a and FILM 488b, Advanced Screenwriting** Marc Lapadula

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 491a and FILM 492b, The Senior Essay** John MacKay

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 493a and FILM 494b, The Senior Project** John MacKay

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 130a, 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

FNSH 140b, 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 minjin.hashbat@yale.edu for more information. L4 RP

French (FREN)

* **FREN 096a, Women's Narratives of Self in Modern French Literature** Maryam Sanjabi

The course explores women's autobiographical literature, demonstrating their uniqueness from an individual perspective and capturing the social, economic, religious, and ethnic themes of the period and their authors' intellectual standpoints. The selected books represent a variety of literary genres ranging from memoir to journal, graphic novel, and film scripts with a focus on the 20th and 21st centuries as they appear in the works of: Colette, Simone de Beauvoir, Nathalie Sarraute, Lucie Aubrac, Hélène Berr, Assia Djebar, Ken Bugul, Agnès Varda, Marjane Satrapi, Marguerite Duras, Annie Ernaux, and Camille Laurens among others. This course thus aims at a critical awareness of what modernity has meant in women's experiences and why debate about its consequences often revolves around women's lives. While some authors explore the coming of age of European gender awareness, others deal with the war and resistance and more recent non-Western voices in French pose the question of identity of the "Other." Course readings include short theoretical essays and a number of secondary works. Readings and discussions are in French, but papers may be submitted in French or English. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

* **FREN 109b, French for Reading** Maryam Sanjabi

Fundamental grammar structures and basic vocabulary are acquired through the reading of texts in various fields (primarily humanities and social sciences, and others as determined by student interest). Intended for students who either need a reading knowledge of French for research purposes or are preparing for French reading examinations and who have had no (or minimal) prior study of French. No preregistration required. Conducted in English. Does not satisfy the language requirement.

* **FREN 110a, 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 RP 1½ Course cr

* **FREN 120b, 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 RP 1½ Course cr

* **FREN 121a, 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 RP 1½ Course cr

* **FREN 125a, 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 130a 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 140a 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 145b, 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 RP 2 Course cr

* **FREN 150a 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 140, 145, or a satisfactory placement test score. Online preregistration required; see <http://french.yale.edu/academics/placement-and-registration> for details. L5

* **FREN 160a 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 RP

* **FREN 170a 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. May not be taken after FREN 171. L5, HU

* **FREN 182b, Creative and Critical Writing Workshop** Lauren Pinzka
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 183a, Medical French: Conversation and Culture** Leo Tertrain
An advanced language course emphasizing verbal communication and culture. Designed to foster the acquisition of the linguistic and cultural skills required to evolve within a Francophone medical environment. Discussions, in-class activities, and group projects in simulated professional situations, with a focus on ethical questions. Topics such as public health policies, pandemics, medicine in Francophone Africa, humanitarian NGOs, assisted reproductive technologies, end-of-life care, and organ donation are explored through films, documentaries, articles, excerpts from essays and literary texts. Conducted entirely in French. Prerequisite: FREN 150 or a satisfactory placement test score, or with permission of instructor. May be taken concurrently with or after FREN 160 and FREN 170. L5

* **FREN 184b, Business French: Communication and Culture** Leo Tertrain
An advanced language course emphasizing verbal communication and culture. Designed to foster the acquisition of the linguistic and cultural skills required to evolve within a Francophone business environment. Discussions, in-class activities, and group projects in simulated professional situations, with a focus on ethical questions. Topics such as human resources, labor unions, labor law, taxation, the service sector, the sharing economy, the green economy are explored through films, documentaries, articles, excerpts from essays and literary texts. Conducted entirely in French. Prerequisite: FREN 150 or a satisfactory placement test score, or with permission of instructor. May be taken concurrently with or after FREN 160 and FREN 170. L5

* **FREN 191a, Translation** Alyson Waters
An introduction to the practice and theory of literary translation, conducted in workshop format. Stress on close reading, with emphasis initially on grammatical

structures and vocabulary, subsequently on stylistics and aesthetics. Translation as a means to understand and communicate cultural difference in the case of French, African, Caribbean, and Québécois authors. Texts by Benjamin, Beckett, Borges, Steiner, and others. Readings in French and in English. After FREN 150 and 151 or with permission of instructor. Preference to juniors and seniors. HU

*** FREN 192b, Intermediate Literary Translation** Alyson Waters

A continuation of FREN 191 for students who wish to work on a longer project and to deepen their reading in translation theory.

Prerequisite: FREN 191. HU

FREN 216a / ENGL 154a / HUMS 134a / LITR 194a, The Multicultural Middle Ages

Ardis Butterfield and Marcel Elias

Introduction to medieval English literature and culture in its European and Mediterranean context, before it became monolingual, canonical, or author-bound. Genres include travel writing, epic, dream visions, mysticism, the lyric, and autobiography, from the Crusades to the Hundred Years War, from the troubadours to Dante, from the *Chanson de Roland* to Chaucer. Formerly ENGL 189. WR, HU

*** FREN 233a, Novels of the Twenty-First Century** Morgane Cadieu

Exploration of twenty-first-century novels by Bernheim, Bouraoui, Darrieussecq, Garréta, NDiaye, Modiano, Pireyre, Rolin, and Volodine. Emphasis on new literary movements and genres as well as on literary life (media, prizes, publishing houses, literary quarrels, digitalization). Topics of the novels include: description of urban and rural settings; memory, war, and migrations; queer and postcolonial subjectivities, ecology; global France and world-literature. Students will be invited to select and read a novel of their choice from the Fall 2021 list of new releases. L5, HU

FREN 240b / HUMS 201b / LITR 214b, The Modern French Novel Alice Kaplan and

Maurice Samuels

A survey of major French novels, considering style and story, literary and intellectual movements, and historical contexts. Writers include Balzac, Flaubert, Proust, Camus, and Sartre. Readings in translation. One section conducted in French. HU TR

*** FREN 307b / LITR 302b, France by Rail: Trains in French Literature, Film, and History** Morgane Cadieu

Exploration of the aesthetics of trains in French and Francophone literature and culture, from the end of the nineteenth-century and the first locomotives, to the automatically driven subway in twenty-first century Paris. Focus on the role of trains in industrialization, colonization, deportation, decolonization, and immigration. Corpus includes novels, poems, plays, films, paintings, graphic novels, as well as theoretical excerpts on urban spaces and public transportation. Activities include: building a train at the CEID and visiting the Beinecke collections and the Art Gallery. May not be taken after FREN 306. WR, HU

*** FREN 322a / THST 302a, Revising Molière** Christophe Schuwey

A star author and a leading actor, Molière is a monument to French and Western cultures. But who#or what#is Molière? What lies behind the myth? This course examines the works and the world of the French Shakespeare, star of Versailles, and author of blockbusters still acclaimed today, 400 years later. Throughout his major comedies (on religion, women's rights, hypocrisy, ethics, travels, and many more topics) we explore the history of the French theater, study the rise of show business

and advertisement, and the competition between authors, and between actors. The course also discusses modern staging of Molière's plays and include performances experiments. L5, HU

* **FREN 330a / HUMS 366a, The World of Victor Hugo's "Les Misérables"** Maurice Samuels

Considered one of the greatest novels of all time, Victor Hugo's *Les Misérables* (1862) offers more than a thrilling story, unforgettable characters, and powerful writing. It offers a window into history. Working from a new translation, this seminar studies Hugo's epic masterpiece in all its unabridged glory, but also uses it as a lens to explore the world of nineteenth-century France—including issues such as the criminal justice system, religion, poverty, social welfare, war, prostitution, industrialization, and revolution. Students gain the tools to work both as close readers and as cultural historians in order to illuminate the ways in which Hugo's text intersects with its context. Attention is also paid to famous stage and screen adaptations of the novel: what do they get right and what do they get wrong? Taught in English, no knowledge of French is required. HU

* **FREN 345a, The Prose Poem** Thomas Connolly

An examination of the *poème en prose*, from its beginnings as a response to the inadequacy of French verse forms through its emergence as an independent genre. L5, HU

* **FREN 366b / HSAR 251, Writers and Artists in Paris, 1780–1914** Marie Girard
Ways in which the transformation of Paris shaped the representation of artists who lived and worked in the French capital from the end of the Old Regime until the eve of World War I. The emergence of Paris as a cultural marker; the role played by the image of the bohemian or the *artiste maudit*. Authors and artists include David, Balzac, Delacroix, Baudelaire, Manet, Mallarmé, impressionist painters, and Picasso. L5, HU

* **FREN 371b / AMST 379b / ENGL 371b / LITR 477b, Fictions of Canada:**

Colonialism, Nationalism, Postcolonialism Katie Trumpener

This seminar explores the literature(s) of Canada in its long history, its considerable linguistic and cultural range, and its complex relationship to political history. 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. Particular focus on Canada's diverse early literatures (from Jesuit hymn to epistolary novel); on the prominent role of women writers across Canadian literature history; on the emergence of an experimental Québécois literature (utilizing Montreal patois as a new literary language) in an era also marked by secularization, modernization and political separatism; of English Canadian attempts to rethink colonial history, and the critiques of Canada's ongoing decolonization process by new generations of indigenous, immigrant and ethnic writers. This course explores both literary history and literary form; the work of internationally famous novelists and poets (Leonard Cohen, Marie-Claire Blais, Margaret Atwood, Alice Munro, Michael Ondaatje) and their innovative local counterparts. Throughout the semester, moreover, our discussion of written literary texts (poems, novels, plays) is supplemented by primarily oral texts, Canadian anthems, ballads, folk, rock and punk songs in a range of Canadian languages). We will thus listen to even as we read Canada. WR, HU

FREN 375a / HSAR 374a, Icons in French Art Marie Girard

The purpose of the course is to focus on the emergence of some of the visual myths, which the large diffusion of pictures through all kind of media (prints, lithographs, photographs, ads) along the 19th century made possible. Based on a selection of works painted between Renaissance and 20th century, which have long been part of the French collections and belong for the most of them to the Musée du Louvre and the Musée d'Orsay, the course focuses on both the genesis of these pictures and the emotional, social, and political response they gained from the public audience when they appeared. Putting them in context and reading some of the main critical texts by Gautier, Baudelaire, Zola and Foucault among others, helps to understand what made Delacroix's *Liberté* or Millet's *Angelus* survive as emblems of the period and keys to French culture. That illuminates how artists shaped French history and sensibility through emblematic works which are still at the center of the visual culture today and how collective myths can grow. Prerequisite: French L5. L5, HU

*** FREN 391b, Fake News and True Stories** Christophe Schuwey

The rise of newspapers and the development of the information culture in the age of Versailles deeply transformed French literature and the relationship of readers to truth and fiction. On the one hand, reading the news became a leisure activity, which created issues surprisingly similar to our contemporary 'fake news' phenomenon. On the other hand, realism became the new paradigm for literature, as audiences craved stories and plays depicting their own world. Authors turned information, rumors, and gossip into novels, comedies, and tragedies. Through works by Molière, La Fayette, Donneau de Visé, Scudéry, Racine, and Corneille as well as the first newspapers, we explore this critical moment that built our modern relationship to fiction and information. L5, HU

*** FREN 403a / HUMS 409a / LITR 224a, Proust Interpretations: Reading
Remembrance of Things Past** R Howard Bloch and Pierre Saint-Amand

A close reading (in English) of Marcel Proust's masterpiece, *Remembrance of Things Past*, with emphasis upon major themes: time and memory, desire and jealousy, social life and artistic experience, sexual identity and personal authenticity, class and nation. Portions from *Swann's Way*, *Within a Budding Grove*, *Cities of the Plain*, *Time Regained* considered from biographical, psychological/psychoanalytic, gender, sociological, historical, and philosophical perspectives. WR, HU

*** FREN 414b / AFST 414b / LITR 269b / MMES 261b, Afterlives of Algeria's
Revolution** Jill Jarvis

The Algerian War for Independence from France was the longest and most violent decolonizing war of the 20th century. This war and its aftermath transformed political, social, intellectual, and artistic life on both sides of the Mediterranean—and it became a model for other decolonizing and civil rights movements across the world. Memory of this war continues to shape current debates in Europe and North Africa about state violence, terrorism, racism, censorship, immigration, feminism, human rights, and justice. Through study of fiction, film, testimonies, graphic novels, and theater, this seminar charts the war's surprising and enduring legacies. Films may include Pontecorvo's *The Battle of Algiers*, Haneke's *Caché*, and Panijel's *Octobre à Paris*. Literary works by Djébar, Camus, Sebbar, Etcherelli, Dib, Cixous, Kateb, Fanon, De Beauvoir, Mechakra. The course is conducted in French. If you have any questions about your French ability, contact the instructor. L5, HU

* **FREN 416b / ER&M 335b / WGSS 416b, Social Mobility and Migration** Morgane Cadieu

Exploration of mobility in the French social landscape and its representations in contemporary French and Francophone texts and films; the intersectionality of class, race, gender, and sexuality; emancipation, migration, demotion, and precarity; labor and the workplace; the interaction between social class and literary style. Works by: Angot, Eribon, Ernaux, Kechiche, Louis, Mukasonga, NDiaye, Taïa. Theoretical excerpts by: Berlant, Bourdieu, Delphy, Fraser, Rancière, Piketty. Students have the possibility to put the corpus in dialogue with the literature of other countries. L5, HU

* **FREN 419b, The Myths of Versailles** Christophe Schuwey

The mythical castle of Louis XIV epitomizes the continuous grasp that the French 17th-century has on the collective imagination. Attracting millions of tourists every year, welcoming expensive Versailles-labeled masked parties, it incarnates the French Classicism of legendary authors including Molière, Corneille, Racine, La Fontaine, Sévigné, and La Fayette. However, just as the castle was once simply a hunting lodge, literature in the age of Louis XIV was not always considered classical: it became such. This course explores and deconstructs the myths of Versailles, from the 17th century to present days. Through literature, music, painting, as well as modern novels and films, we study canonical and less-canonical works, inquiring how the mythical image was built, integrated into national identity and maintained, reading the resistance it raised then and now against this cultural hegemony and understanding how some authors (especially women writers) were dismissed by history while being genuine superstars back then. In the shadows of the monument appears a vivid world, full of fascinating cultural, commercial, and political struggles. L5, HU

* **FREN 425b / AFST 425b / MMES 360b, North African French Poetry** Thomas Connolly

Introduction to North African poetry composed in French during the twentieth and twenty-first centuries. Works explored within the broader context of metropolitan French, Arabic, and Berber cultures; juxtaposition with other modes of expression including oral poetry, painting, dance, music, the Internet, and film. The literary, aesthetic, political, religious, and philosophical significance of poetic discourse. L5, HU

* **FREN 442a / AFST 443a / LITR 484a / MMES 402a, Decolonizing Memory : Africa & the Politics of Testimony** Jill Jarvis

This seminar explores the politics and poetics of memory in a time of unfinished decolonization. It also provides students with a working introduction to anticolonial, postcolonial, and decolonial critique. Together we bring key works on the topics of state violence, trauma, and testimony into contact with literary works and films by artists of the former French and British empires in Africa. Reading literary and theoretical works together permits us to investigate archival silences and begin to chart a future for the critical study of colonial violence and its enduring effects. Literary readings may include works by Djébar, Rahmani, Ouologuem, Sebbar, Diop, Head, Krog. Films by Djébar, Leuvre, Sembène, and Sissako. Theoretical readings may include works by Arendt, Azoulay, Césaire, Derrida, Fanon, Mbembe, Ngũgĩ, Spivak, and Trouillot. WR, HU

*** FREN 491a or b / FREN 492a or b, 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 492a or b / FREN 491a or b, The Senior Essay – Translation Track 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 track cannot be the same as the materials submitted for the translation courses. For additional information, consult the director of undergraduate studies.

*** FREN 493a and FREN 494b / FREN 495a and FREN 496b, 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 495a and FREN 496b / FREN 493a and FREN 494b, The Senior Essay in the Intensive Major – Translation Track 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 track cannot be the same as the materials submitted for the translation courses. For additional information, consult the director of undergraduate studies.

German Studies (GMAN)

*** GMAN 100a, German for Reading** Staff

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 110a, 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. Students must preregister through Preference Selection during the online preregistration period. Details and a link to Preference Selection are provided on the German department Web site at <http://german.yale.edu>.

L1 1½ Course cr

GMAN 120a, Elementary German II Marion Gehlker

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. Students must preregister through Preference Selection during the online preregistration period. Details and a link to Preference Selection are provided on the German department Web site at <http://german.yale.edu>. L2 1½ Course cr

GMAN 125a, Intensive German I Lieselotte Sippel

Intensive training in speaking, reading, writing, and comprehending the language. Focus on the mastery of formal grammar. For beginning students of superior linguistic ability. L1, L2 2 Course cr

GMAN 130a, 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. Students must preregister through Preference Selection during the online preregistration period. Details and a link to Preference Selection are provided on the German department Web site at <http://german.yale.edu>. L3 1½ Course cr

*** GMAN 152a, Advanced German, Contemporary Germany** Staff

An advanced language and culture course focusing on contemporary Germany. Analysis and discussion of current events in Germany and Europe through the lens of German media, including newspapers, books, TV, film radio, and modern electronic media formats. Focus on oral and written production to achieve advanced linguistic skills. After GMAN 140 or 145. For entering students with a score of 5 on the German Advanced Placement test, or according to results of the placement examination. Students must preregister through Preference Selection during the online preregistration period. Details and a link to Preference Selection are provided on the German department Web site at <http://german.yale.edu>. L5, HU

*** GMAN 162a, Pre-1945 German Culture and History** Marion Gehlker

An advanced language course focusing on improving upper-level written and oral language skills through the discussion of selected aspects of pre-1945 German culture, politics, and history in literary and nonliterary texts, films, and the arts. Topics include the Kaiserreich, the Weimar Republic, Expressionist art and film, youth movements, social democracy, and Nazi Germany. Emphasis on vocabulary building through frequent oral and written assignments. After GMAN 140, 145, or 150, or with permission of instructor. L5, HU

*** GMAN 177a, Introduction to German Literature and Film** Paul North

Study of key films and works of the twentieth-century around problems of the state, with focus on development of advanced reading comprehension, writing, and speaking skills. Films from the Weimar period to recent Berlin School realism by directors

Wiene, Lang, Kluge, Haneke, Petzold, and Farocki. Readings from short stories, novellas, and essays by Kafka, Kracauer, Arendt, Böll, Wolf, Schlögel, and Passig. Prerequisite: GMAN 150 or L5 placement. L5

GMAN 208b / HIST 254b, 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

*** GMAN 248a or b / HUMS 236a or b / LITR 240a or b / THST 248a, Goethe's Faust**
Kirk Wetters and Jan Hagens

Goethe's *Faust*, with special attention to *Faust II* and to the genesis of *Faust* in its various versions throughout Goethe's lifetime. Emphasis on the work in context of Goethe's time and in the later reception and criticism. Reading knowledge of German beneficial but not required. HU

*** GMAN 273a / FILM 319a / LITR 368a, The Third Reich in Postwar German Film, 1945 to Present** Jan Hagens

Close study of the intersection of aesthetics and ethics with regard to how German films, since 1945, have dealt with Nazi history. Through the study of German-language films (with subtitles), produced in postwar East, West, and unified Germany, students consider and challenge perspectives on the Third Reich and postwar Germany, while learning basic categories of film studies. HU

*** GMAN 288a / HUMS 480a / LITR 482a / PHIL 469a, The Mortality of the Soul: From Aristotle to Heidegger** Martin Hagglund

This course explores fundamental philosophical questions of the relation between matter and form, life and spirit, necessity and freedom, by proceeding from Aristotle's analysis of the soul in *De Anima* and his notion of practical agency in the *Nicomachean Ethics*. We study Aristotle in conjunction with seminal works by contemporary neo-Aristotelian philosophers (Korsgaard, Nussbaum, Brague, and McDowell). We in turn pursue the implications of Aristotle's notion of life by engaging with contemporary philosophical discussions of death that take their point of departure in Epicurus (Nagel, Williams, Scheffler). We conclude by analyzing Heidegger's notion of constitutive mortality, in order to make explicit what is implicit in the form of the soul in Aristotle.

HU

*** GMAN 307a / HUMS 374a / LITR 464a, Greed and Its Discontents: From Aristotle to the Present** Paul North

Money matters, whether we like it or not. Besides being an economic means, it plays a pervasive role in the lives of individuals and the social fabric at large—a role scrutinized by writers, philosophers, and cultural theorists. By opening up a vast horizon of possibilities, money represents power and desire. It is regarded as an enabler of freedom by some, and as a source of alienation by others. Money is said to be detrimental to social cooperation, as it fuels the “frenzy to achieve distinction” (Jean-Jacques Rousseau). When it comes to greed and its discontents, issues of status, recognition, and contempt come into play. Money, which has been called an “abstract” form of happiness (Arthur Schopenhauer), permeates the debates on the intricate relation between well-being, welfare, and wealth. On a macro level, the standings of

different social spheres, including the economy, politics, and the realm of intimate relationships, depend on the question of whether “everything is for sale” or not (Debra Satz). In this course, we explore the meaning of money by tracing the arc from Aristotle to the present. HU TR

* **GMAN 312a / ENGL 257a / HUMS 208a / LITR 485a, Poe and Kafka** Caleb Smith and Paul North

Some mysteries seem unresolvable by science or religion. For instance, there is the mystery of how people remain hidden from themselves#of repressed impulses and buried truths that find expression in fantasies, dreams, and other strange visions. A word for this mystery is the unconscious. Some terms for its literature include the gothic and the grotesque. Our experimental course pursues this mystery by studying two writers working in different languages, in different centuries, in a variety of minor, unprestigious genres: Edgar Allan Poe and Franz Kafka. We use tales and other short texts by each writer to illuminate the other’s techniques for examining the psychological and political unconscious. WR, HU

* **GMAN 362a / HUMS 372a / LITR 489a, 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 368a / FILM 419a / LITR 382a, German New Waves in Cold War Europe** Katie Trumpener

Comparative study of New Wave cinema in East and West Germany, with a focus on aesthetic ferment, institutional barriers, and transformation. Berlin as the best place to follow Europe's emerging cinematic New Waves before 1961. Distinctive approaches developed by young filmmakers in East and West Germany to political and documentary filmmaking, to the Nazi past and the Cold War, and to class, gender, and social transformation. Knowledge of German helpful but not necessary. WR, HU

* **GMAN 373b / HIST 455Jb / HUMS 287b / WGSS 347b, Resistance in Theory and Practice** Terence Renaud

Exploration of the histories and theories of resistance in the modern world. How liberation movements, guerrillas, and oppressed groups appeal to resistance as an organizational strategy and as moral justification. Readings include Kant, Thoreau, Nietzsche, Luxemburg, Lenin, Gandhi, Fanon, Arendt, Marcuse, Foucault, A. Lorde, Said, and J. Butler. Themes include antifascism to terrorism; violence to nonviolence, the New Left to Black Lives Matter. HU

GMAN 381b / PHIL 204b, Kant's Critique of Pure Reason Paul Franks

An examination of the metaphysical and epistemological doctrines of Kant's *Critique of Pure Reason*. Prerequisite: PHIL 126 or DRST 004. HU

* **GMAN 382a / JDST 217a / PHIL 424a, Hegel's Phenomenology of Spirit** Paul Franks and Hugo Havranek

A close reading of sections of one of the major works in post-Kantian philosophy. Themes include varieties of scepticism and responses to scepticism; the relationship of epistemology to questions concerning structures of social practices of reasoning; the historical character of reason; the relationship between natural processes and social developments; the intersubjectivity of consciousness; and the possibility of a philosophical critique of culture. Attention paid both to commentaries that focus on historical development and to approaches that view historical narratives as allegories whose deeper meaning may be formulated as a logical or semantic theory. Two previous philosophy courses, including some exposure to Kant and German Idealism, through either DRST 004 or PHIL 126 or PHIL 214 or PHIL 261. Students are particularly encouraged but not required to take PHIL 261 before taking this course. HU

* **GMAN 408a / AFAM 418a, Marx & Abolition Today** Cecilia Sebastian
W.E.B. du Bois, C.L.R. James, Franz Fanon, Angela Davis, and Ruth Wilson Gilmore are just a few of the radical thinkers for whom Karl Marx's writings on history, capitalism, and revolution have provided both vehicle and object of critique in their efforts to end systems of racial oppression, including slavery, colonialism, imperialism, incarceration, and policing. This course explores the reception of Marx by abolitionist thinkers in combination with Marx's own writings on anti-slavery and anti-colonial struggles. We ask: How have abolitionist movements historically informed, expanded, and challenged Marxian theory and its tactical playbook? How, in turn, have anticommunist, racist, and security-statist ideologies been mobilized to undermine and defeat transformative social movements? Finally, how do contemporary struggles against racial domination within capitalist societies inform our grasp of these archives? While this course focuses on movement-based thinkers, including those mentioned above, we also read critical interventions in the Marxist intellectual tradition by Theodor Adorno, Cedric Robinson, Barbara and Karen Fields, and others. HU

* **GMAN 414a / HUMS 414a / LITR 262a, Georg Büchner's Revolutions** Rudiger Campe

Georg Büchner's (1813-1837) is a work across times and places. In *Danton's Death* he reenacts the French Revolution, in the pamphlet *Hessian Messenger* he calls for revolution in German lands. Büchner's other, simultaneous, revolution is one of language and literature. In the narrative *Lenz* and the theater play *Woyzeck*, Büchner turns the Romanticism of his own time upside down and the two works resurface only ca. 1900 as trail blazers of social naturalism and modernist (postdramatic) theater. Celan, in the *Meridian*, gives an idiosyncratic account of Büchner's travel across times and places. The course contextualizes the close reading of Büchner's work with materials from the French Revolution, early socialists, Marx; French, German, British Romanticism; prose and theater ca. 1900 when Büchner is rediscovered; Celan. HU

* **GMAN 489a / CLCV 305a / HSAR 489a, Pathos-Figures: Affection-Images in the Visual Arts** Nicola Suthor

Images with high pathos inform our perception of human life and define our stance in the world. The seminar wants to foster a critical awareness of the formative power that pathos figures exert on our moral beliefs concerning human behavior. The course covers the timespan from Antiquity to Modernity in Western culture and deals with historical moments that reflect different attempts to cultivate and temper strong

emotions. We discuss the transfer of pathos and how the dissemination of eminent pathos figures of antiquity have shaped the imagery of the Western canon; we tackle with one of the most far-reaching concepts of art history, Aby Warburg's Pathos formula that encourages us to draw in broad strokes connecting lines of affection over centuries and different cultures; we look into the discourse on human suffering in Medieval times and how it has defined the Christian doctrine of the affective image; we have a close look at treatises of the 17th century that worked on theorizing human passions and discuss the Enlightenment perspective that aimed at interiorizing pathos by dint of the discourse of beauty; we discuss the Modern "close-up" and how it unfolds the moment of pure bodily presence as highly affective entity. We ask if we are in need of new pathos images that reflect our current emotional stakes, and how they might look. HU

Global Affairs (GLBL)

GLBL S268Eb / PLSC 111b / PLSC S111E, Introduction to International Relations

Kenneth Scheve

Course closed to further enrollment. Online Course. Survey of key debates and concepts in international relations. Exploration of historical and contemporary issues using Western and non-Western cases and evidence. Topics include the rise of states; causes, conduct, and outcomes of wars; the emergence of new actors and forms of conflict; and evolution of global economy. Enrollment limited to 20 students. 1 Credit. Technology Fee: \$85. Tuition: \$4,500. Session A: June 7 - July 9. SO

GLBL 101a, Gateway to Global Affairs Emma Sky

Collaboration between faculty and practitioners to discuss key topics and themes related to diplomacy, development, and defense. SO

GLBL 121a, Applied Quantitative Analysis Justin Thomas

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. The course assumes no prior knowledge of statistics and no mathematical knowledge beyond calculus. QR

GLBL 159a / ECON 159a, Game Theory Benjamin Polak

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

GLBL 195b / PLSC 341b, The Logic of Randomized Experiments in Political Science

Alexander Coppock

Instruction in the design, execution, and analysis of randomized experiments for businesses, nonprofits, political organizations, and social scientists. Students learn to evaluate the impact of real-world interventions on well-defined political, economic, and social outcomes. Specific focus on randomized experimentation through field and

survey experiments, with design and analysis principles extending to lab and so-called "natural" experiments. Any introductory probability or statistics course. QR, SO

GLBL 203b / PLSC 186b, Globalization and Domestic Politics Didac Queralt
Examination of the political and institutional conditions that explain why some politicians and interest groups (e.g. lobbies, unions, voters, NGOs) prevail over others in crafting foreign policy. Consideration of traditional global economic exchange (trade, monetary policy and finance) as well as new topics in the international political economy (IPE), such as migration and environmental policy.

* **GLBL 215a / LAST 386a / MGRK 237a / PLSC 375a / SOCY 389a, Populism** Paris Aslanidis

Investigation of the populist phenomenon in party systems and the social movement arena. Conceptual, historical, and methodological analyses are supported by comparative assessments of various empirical instances in the US and around the world, from populist politicians such as Donald Trump and Bernie Sanders, to populist social movements such as the Tea Party and Occupy Wall Street. SO

* **GLBL 216a / PLSC 173a, Democracy Promotion and Its Critics** Sarah Bush
A seminar on the history, justifications, and various forms of democracy promotion – and their controversies. Topics include foreign aid, election observers, gender, international organizations, post-conflict development, revolutions, and authoritarian backlash.

GLBL 217a / EVST 292a / PLSC 149a, Sustainability: Environment, Energy, and the Economy in the 21st Century Daniel Esty

Sustainability as a guiding concept for addressing twenty-first century tensions between economic, environmental, and social progress. Using a cross-disciplinary set of materials from the "sustainability canon," students explore the interlocking challenges of providing abundant energy, reducing pollution, addressing climate change, conserving natural resources, and mitigating the other impacts of economic development. SO

* **GLBL 218a / MMES 318a / PLSC 193a, Security in North Africa and the Middle East** Staff

This course explores the debates about regional security in North Africa and the Middle East, mainly from a critical security perspective. Traditional and non-traditional security challenges are discussed throughout the semester. The state is presented as much a subject of security as a subject of insecurity for individuals and groups of people. This is to say that security here is not state-centered. North Africa and the Middle East are mostly dealt with separately, with very few exceptions. SO

GLBL 219b / ECON 375b, 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

* **GLBL 222a, Research Design and Quantitative Analysis with a Focus on Africa** Tumi Makgetla

Learn about the application of advanced quantitative research methods through research on African politics and development topics. Students develop their proficiency to critically engage social science research while also learning how to implement these

techniques. The class begins with a discussion of research in developing contexts, including discussions of data availability and using research to support policy-making, followed by an overview of causal inference. Next, students are introduced to several prominent research design techniques including time series analysis, regression discontinuity design, difference-in-difference methods, instrumental variables analysis and various experimental designs. Each week students discuss papers using these methods on topics related to ethnic favoritism and clientelism, conflict and economic growth, rural/ urban politics and voter turnout in the African context. Students learn to implement some of these analyses using *R* statistical software and data from African sources such as Afrobarometer and Statistics South Africa. so

GLBL 236a / PLSC 182a, The Politics of International Law and Cooperation Tyler Pratt

This course focuses on the political processes and institutions that facilitate cooperation among states. Students examine the obstacles to cooperation in the international arena, the reasons for the creation of international laws and institutions, and the extent to which such institutions actually affect state policy. Students also explore the tension between international cooperation and concerns about power, state sovereignty, and institutional legitimacy. Course materials draw from a variety of substantive issues, including conflict prevention, trade, human rights, and environmental protection. so

* **GLBL 237a / ECON 185a, 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 244a / PLSC 445a, The Politics of Fascism** Lauren Young

The subject of this course is fascism: its rise in Europe in the 1930s and deployment during the Second World War as a road map to understanding the resurgence of nationalism and populism in today's political landscape, both in Europe and the United States. The course begins with an examination of the historic debates around fascism, nationalism, populism, and democracy. It then moves geographically through the 1930s and 1940s in Europe, looking specifically at Weimar Germany, Vichy France, the rise of fascism in England in the 1930s, and how fascist ideology was reflected in Italy's colonial ambitions during the Abyssinian War. The course examines fascism and the implementation of racial theory and the example of anti-Semitism as an ideological and political tool. It also looks at the emergence of fascism in visual culture. The second part of the seminar turns to fascist ideology and the realities of today's political world.

We examine the political considerations of building a democratic state, question the compromise between security and the preservation of civil liberties and look at the resurgence of populism and nationalism in Europe and the US. The course concludes by examining the role of globalization in contemporary political discourse. so

GLBL 253b / ARCH 341b / LAST 318b / URBN 341b, Globalization Space Keller Easterling

Infrastructure space as a primary medium of change in global polity. Networks of trade, energy, communication, transportation, spatial products, finance, management, and labor, as well as new strains of political opportunity that reside within their spatial disposition. Case studies include free zones and automated ports around the world, satellite urbanism in South Asia, high-speed rail in Japan and the Middle East, agripoles

in southern Spain, fiber optic submarine cable in East Africa, spatial products of tourism in North Korea, and management platforms of the International Organization for Standardization. HU

* **GLBL 259a / EP&E 302a / HIST 469Ja / PLSC 391a, State Formation** Didac Queralt
Study of the domestic and international determinants of functional states from antiquity to date. Analysis of state-formation in Europe in pre-modern and outside Europe from colonial times to date. Topics include centralization of power, capacity to tax, and contract enforcement. SO

GLBL 260b / PLSC 130b, Nuclear Politics Alex Debs
The pursuit, use, and non-use of nuclear weapons from the Manhattan Project to the present. The effect of the international system, regional dynamics, alliance politics, and domestic politics in the decision to pursue or forgo nuclear weapons. The role of nuclear weapons in international relations, the history of the Cold War, and recent challenges in stemming nuclear proliferation. SO

* **GLBL 271a / MMES 271a, Middle East Politics** Emma Sky
Exploration of the international politics of the Middle East through a framework of analysis that is partly historical and partly thematic. How the international system, as well as social structures and political economy, shape state behavior. Consideration of Arab nationalism; Islamism; the impact of oil; Cold War politics; conflicts; liberalization; the Arab-spring, and the rise of the Islamic State. SO

* **GLBL 274b / PLSC 137b, Terrorism** Bonnie Weir
Theoretical and empirical literature used to examine a host of questions about terrorism. The definition(s) of terrorism, the application of the term to individuals and groups, the historical use and potential causes of terrorism, suicide and so-called religious terrorism, dynamics within groups that use terrorism, and counterterrorism strategies and tactics. Theoretical readings supplemented by case studies. SO

GLBL 275a / PLSC 188a, Approaches to International Security Dawn Brancati
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

* **GLBL 282b / EVST 255b / F&ES 255b / PLSC 215b, Environmental Law and Politics: Global Food Challenges** John Wargo

We explore relations among food, environment, health, and law. We consider global-scale *avoidable* challenges such as: starvation and malnutrition, obesity, other food related human diseases, climate instability, soil loss, water depletion and contamination, microbial hazards, chemical contamination, food waste, dietary convergence, air pollution, energy, packaging, culinary globalization, and biodiversity loss. We focus on laws that influence the world's food system, including those intended to reduce or prevent environmental and health damages. Other laws protect rights of secrecy, property, speech, confidential business information, free trade, worker protection, equal opportunity, and freedom from discrimination. Ethical concerns of justice, equity, and transparency are prominent themes. Examples of effective law, consumer movements and corporate innovations provide optimism for the future of responsible food. SO

* **GLBL 289a or b / HIST 245Ja or b / PLSC 431a or b, War and Peace in Northern Ireland** Bonnie Weir

Examination of theoretical and empirical literature in response to questions about the insurgency and uneasy peace in Northern Ireland following the peace agreement of 1998 which formally ended the three-decade long civil conflict known widely as The Troubles and was often lauded as the most successful of its kind in modern history. Consideration of how both the conflict and the peace have been messier and arguably more divisive than most outside observers realize. SO

* **GLBL 299a / EP&E 299a / PLSC 332a, Philosophy of Science for the Study of Politics** Ian Shapiro

An examination of the philosophy of science from the perspective of the study of politics. Particular attention to the ways in which assumptions about science influence models of political behavior, the methods adopted to study that behavior, and the relations between science and democracy. Readings include works by both classic and contemporary authors. SO

* **GLBL 307a / ECON 467a, 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. Prerequisites: intermediate microeconomics and macroeconomics. SO

GLBL 308a / ECON 424a, 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

GLBL 309b / EAST 310b / PLSC 357b, The Rise of China Daniel Mattingly

Analysis of Chinese domestic and foreign politics, with a focus on the country's rise as a major political and economic power. Topics include China's recent history, government, ruling party, technology, trade, military, diplomacy, and foreign policy. SO

* **GLBL 310a / ECON 407a, International Finance** Ana Fielor

A study of how consumers and firms are affected by the globalization of the world economy. Topics include trade costs, the current account, exchange rate pass-through, international macroeconomic co-movement, multinational production, and gains from globalization. Prerequisite: intermediate macroeconomics or equivalent. SO

* **GLBL 311a / ECON 480a, Banking Crises and Financial Stability** Sigridur Benediktsdottir

Focus on systemic risk, banking crises, financial stability and macroprudential policies. Additional emphasis on systemic risk and prudential policies in peripheral European economies and emerging economies. Prerequisites: ECON 115 and 116, or equivalent.

SO

* **GLBL 330b / ECON 465b / EP&E 224b, 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

* **GLBL 341b / PLSC 450b, The Geopolitics of Democracy** Lauren Young
 The threats to liberal democracy are being widely debated, from the US and Europe to developing nations. In order for democracy to continue to thrive as the cornerstone of Western governance, it must adapt and be relevant to citizens of the 21st century. This course examines our appreciation of what constitutes democracy today and how to apply those understandings to the challenges of the 21st century. Our discussions look at the characteristics of democratic leaders and debate whether America, the bulwark of liberal democracy in the 20th century, is still an exporter of democracy and how that matters in today's world. We then look at how to protect and adapt democratic institutions such as free elections, civil society, dissent, and the free press in the face of a rising wave of populism and nationalism. The course examines how refugee crises from conflict regions and immigration impact democracies and debate the accelerating paradigm shifts of income inequality and technology on democratic institutions. We conclude the course with a discussion of the forms of democratic governance that are meaningful in the 21st century and the practicalities of designing or reforming democratic institutions to confront current challenges. SO

* **GLBL 344a / HIST 483Ja / PLSC 161a, Studies in Grand Strategy II** Beverly Gage
 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

* **GLBL 388a, The Politics of American Foreign Policy** Howard Dean
 This seminar addresses the domestic political considerations that have affected American foreign policy in the post-World War II world. The goals of the course are to (1) give historical context to the formation of major existing global governance structures, (2) give students an opportunity to research how major foreign policy decisions in the past were influenced by contemporary political pressure, and (3) assess what effect those pressures have had on today's global issues. Case studies include, but are not limited to: Truman and the Marshall Plan; Johnson and the Vietnam War; Nixon and the opening of China; Reagan and the collapse of the Soviet Union, George HW Bush and Iraq, Clinton and the Balkans, and Obama and the development of a multipolar foreign policy for a multipolar world. SO

GLBL 392a, Intelligence, Espionage, and American Foreign Policy Ted Wittenstein
 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.

* **GLBL 393a / ANTH 386a, Humanitarian Interventions: Ethics, Politics, and Health**

Catherine Panter-Brick

Analysis of humanitarian interventions from a variety of social science disciplinary perspectives. Issues related to policy, legal protection, health care, morality, and governance in relation to the moral imperative to save lives in conditions of extreme adversity. Promotion of dialogue between social scientists and humanitarian practitioners. WR, SO

* **GLBL 394a / ANTH 409a / ER&M 394a / EVST 422a / F&ES 422a, Climate and Society from Past to Present** Michael Dove

Discussion of the major currents of thought—both historic and contemporary—regarding climate, climate change, and society; focusing on the politics of knowledge and belief vs disbelief; and drawing on the social sciences and anthropology in particular. WR, SO

* **GLBL 395a, Data Governance in the Digital Age** Nathaniel Raymond

The information revolution is causing the rapid mass adoption of information communication technologies (ICTs) across nations, demographics, and sectors in the early 21st Century—such as mobile devices, social media platforms, “big data,” artificial intelligence (AI), and machine learning, geospatial mapping applications, and the Internet of Things (IoT). However, 20th Century international data governance policies, normative frameworks, and domestic regulations are struggling to keep pace with the disruptive impacts ICTs are having on an increasingly digitally networked world. This seminar explores critical issues, trends, and events relevant to both the adaption of existing data governance regimes to meet these challenges and the creation of new regimes by international organizations, the private sector, civil society, and national governments. The primary learning goal of the course is to equip students with the skills to critically read and apply extant international data governance policies in concrete sector-specific contexts (i.e. corporate, governmental, humanitarian, development, etc.). Additionally, students learn to identify gaps in current regimes and to be literate in the major ongoing debates on these issues at the United Nations, the EU, the United States Congress, and other critical loci of policy development. SO

* **GLBL 398a / HIST 426Ja, Yale and the World: Global Power, Local History** David

Engerman

This course uses moments in the history of Yale University to shed light on the forms, functions, and trajectory of U.S. global power from the late 19th century through the early 21st century. Key episodes include missionary work in East Asia, scientific expeditions in South America, mobilization for war and Cold War, and the internationalization of the student body. Students investigate these episodes by reading scholarly work as well as archival sources, and through discussions with Yale faculty and staff. HU

* **GLBL 420a / HLTH 490a, Global Health Research Colloquium** Robert Hecht

How can health gains for low and middle-income households and nations be accelerated and sustained through better policy and resource allocation choices by governments, communities, and international organizations? Using data and customized analytical techniques, students explore ways to formulate and assess policy

and program options to address the most pressing health challenges of our times (e.g., HIV, vaccine-preventable illness, non-communicable diseases, pandemics such as Ebola and Covid-19). We examine a series of 8-10 leading analytical frameworks and tools and see how they can be applied to major health issues in Africa, Asia, and Latin America to generate important insights and impacts on the ground. Students contribute to shaping the agenda for further development of innovative methods for global health policy research and advisory services and implementation and pursue their own mini project on a topic of their choosing. Prerequisite: HLTH 230. This is a required course for the Global Health Scholars in their senior year. Enrollment is limited to 18, and preference is given to Global Health Fellows. Students must have completed global health fieldwork. RP

* **GLBL 450a, Directed Research** Sigridur Benediksdottir

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.

Global Health Studies (HLTH)

* **HLTH 081a, 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. Covid-19 is the primary focus this semester with a survey of epidemiology and other fields related to its coverage. Students critique and produce medical journalism and look at the history of coverage of topics such as vaccination, the value of cancer screening and genetic testing, determinants of a healthy lifestyle, the U.S. role in global health, and the cost of health care. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.

* **HLTH 155a / E&EB 106a / MCDB 106a, 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 freshmen and sophomores. Prerequisite: high school biology. SC

* **HLTH 250a / E&EB 335a, Evolution and Medicine** Brandon Ogbunu

Introduction to the ways in which evolutionary science informs medical research and clinical practice. Diseases of civilization and their relation to humans' evolutionary past; the evolution of human defense mechanisms; antibiotic resistance and virulence in pathogens; cancer as an evolutionary process. Students view course lectures on line; class time focuses on discussion of lecture topics and research papers. Prerequisite: BIOL 101-104. WR, SC

* **HLTH 370b / ER&M 360b / HSHM 432b / SOCY 390b / WGSS 390b, Politics of Reproduction** Rene Almeling

Reproduction as a process that is simultaneously biological and social, involving male and female bodies, family formation, and powerful social institutions such as medicine, law, and the marketplace. Sociological research on reproductive topics such as pregnancy, birth, abortion, contraception, infertility, reproductive technology, and

aging. Core sociological concepts used to examine how the politics of reproduction are shaped by the intersecting inequalities of gender, race, class, and sexuality. WR, SO

* **HLTH 420a / EP&E 346a, Global Health Ethics** Cara Fallon

When a new virus sweeps the globe, how should physicians, governments, and societies respond? What are an individual's rights and responsibilities in the face of illness, and how do public health organizations prioritize competing claims? How should issues of consent, quarantine, compulsory treatment, and surveillance be managed, and how do these issues change as they transcend geographic borders? This seminar examines critical issues in global health through the method of ethical analysis. The course begins with the foundations for analyzing ethical problems, considering moral and ethical frameworks for health. We examine dilemmas such as quarantines, access to care, and the limits of autonomy, and we delve into critical challenges of vulnerable populations and global inequities. We conclude by analyzing emerging tensions posed by artificial intelligence and digital health technologies. Drawing together global health perspectives and ethical analysis, we consider the principles, tradeoffs, and central tensions that inform global health today. WR, SO

* **HLTH 490a / GBL 420a, Global Health Research Colloquium** Robert Hecht

How can health gains for low and middle-income households and nations be accelerated and sustained through better policy and resource allocation choices by governments, communities, and international organizations? Using data and customized analytical techniques, students explore ways to formulate and assess policy and program options to address the most pressing health challenges of our times (e.g., HIV, vaccine-preventable illness, non-communicable diseases, pandemics such as Ebola and Covid-19). We examine a series of 8-10 leading analytical frameworks and tools and see how they can be applied to major health issues in Africa, Asia, and Latin America to generate important insights and impacts on the ground. Students contribute to shaping the agenda for further development of innovative methods for global health policy research and advisory services and implementation and pursue their own mini project on a topic of their choosing. Prerequisite: HLTH 230. This is a required course for the Global Health Scholars in their senior year. Enrollment is limited to 18, and preference is given to Global Health Fellows. Students must have completed global health fieldwork. RP

Hebrew (HEBR)

HEBR 110a, 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 120b, 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 RP 1½ Course cr

* **HEBR 130a or b, Intermediate Modern Hebrew I** Staff

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 120 or equivalent. L3 RP 1½ Course cr

* **HEBR 150a / JDST 213a / MMES 150a, Advanced Modern Hebrew: Daily Life in Israel** Orit Yeret

An examination of major controversies in Israeli society. Readings include newspaper editorials and academic articles as well as documentary and historical material. Advanced grammatical structures are introduced and practiced. Conducted in Hebrew. Prerequisite: HEBR 140 or equivalent. L5 RP

* **HEBR 159b / JDST 409b / MMES 159b, 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 140 or permission of instructor. L5 RP

* **HEBR 160b / JDST 360b / MMES 155b, Hebrew in a Changing World** Dina Roginsky

Focus on how Hebrew language is used in Israel for constructing social norms, expectations, and day-to-day experiences. Topics include gendered language, political and PC language, military language, slang, humor, dialects, accents, name-giving practices, language in a sacred and in a secular context, and Americanization of the Hebrew language. Materials include advertisements, internet forums, movie clips, skits, maps, political stickers, and newspapers. Prerequisite: HEBR 140 or permission of instructor. L5

* **HEBR 162a / JDST 319a / MMES 161a, Israel in Ideology and Practice** Dina Roginsky

An advanced Hebrew class focusing on changing ideology and politics in Israel. Topics include right and left wing political discourse, elections, State-Religion dynamics, the Jewish-Arab divide, and demographic changes. Materials include newspapers, publications, on-line resources, speeches of different political and religious groups, and contemporary and archival footage. Comparisons to American political and ideological discourse. Prerequisite: HEBR 140 or permission of instructor. L5 RP

* **HEBR 164b / JDST 417b / MMES 167b, 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 170a / JDST 421a / MMES 365a, Contemporary Israeli Art (1948 until today)** Orit Yeret

An advanced level Modern Hebrew course which focuses on contemporary Israeli art, from 1948 until today. The course aims to expand student's knowledge of the Hebrew language and refine their writing, reading, speaking, and listening skills through the exposure to authentic materials in the field of the visual arts. Students engage

with diverse Israeli visual art productions – such as: paintings, drawings, sculpture, photography, new media etc. – and employ critical thinking to discuss and analyze a variety of art pieces. Prerequisite: Completion of L4 (Modern Hebrew) or a placement exam. L5 RP

Hindi (HNDI)

* HNDI 110a, 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 120b, Elementary Hindi II Staff

Continuation of HNDI 110. After HNDI 110 or equivalent. L2 1½ Course cr

HNDI 130a, Intermediate Hindi I Swapna Sharma

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 132a, Accelerated Hindi I Swapna Sharma

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 140b, Intermediate Hindi II Swapna Sharma

Continuation of HNDI 130. After HNDI 130 or equivalent. L4 1½ Course cr

* HNDI 142b, Accelerated Hindi II Swapna Sharma

Continuation of HNDI 132. Development of increased proficiency in the four language skills. Focus on reading and higher language functions such as narration, description, and comparison. Reading strategies for parsing paragraph-length sentences in Hindi newspapers. Discussion of political, social, and cultural dimensions of Hindi culture as well as contemporary global issues. L4

HNDI 150a, 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 198a or b, 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 002b, **Myth, Legend, and History in New England** Mark Peterson

This seminar explores the complex and multi-faceted process of remembering and representing the past, using the New England region as our laboratory and drawing on the resources of Yale and the surrounding region for our tools. Human events are evanescent—as soon as they happen, they disappear. Yet they live on in many forms, embodied in physical artifacts and the built environment, converted to songs, stories, and legends, inscribed in written records of a thousand sorts, depicted in graphic images from paintings and sketches to digital photographs and video. From these many sources people form and reform their understanding of the past. In this seminar, we examine a series of iconic events and patterns deeply embedded in New England's past and analyze the contested processes whereby historians, artists, poets, novelists, and other “remembrancers” of the past have attempted to do this essential work. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

* HIST 006a / HSHM 005a, **Medicine and Society in American History** Rebecca Tannenbaum

Disease and healing in American history from colonial times to the present. The changing role of the physician, alternative healers and therapies, and the social impact of epidemics from smallpox to AIDS. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

* HIST 022a, **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. Preregistration required; see under First-Year Seminar Program. WR, HU

* HIST 025b / HUMS 035b / PLSC 035b, **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. Preregistration required; see under First-Year Seminar Program. SO

* HIST 030b / EAST 030b, **Tokyo** Daniel Botsman

Four centuries of Japan's history explored through the many incarnations, destructions, and rebirths of its foremost city. Focus on the solutions found by Tokyo's residents to the material and social challenges of concentrating such a large population in one place. Tensions between continuity and impermanence, authenticity and modernity,

and social order and the culture of play. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

*** HIST 031a or b, What Makes An American?: U.S. National Identity, Founding to Present** Staff

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. Preregistration required; see under First-Year Seminar Program. WR, HU

*** HIST 039a / SAST 020a, Bombay/Mumbai: Life in a Megacity** Rohit De
Mumbai as a case study for the transformations brought by urbanization and modernity in Asia. Focus on how Mumbai’s residents and its planners navigated the challenges of living in a rapidly growing cosmopolitan city and reflected it in their art and ideas. Themes include capitalism, globalization, British empire, religious pluralism, radical politics, organized crime, and Bollywood. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** HIST 060a, History of Crime and Punishment** Sergei Antonov
Changing attitudes and policies towards crime from the ancient world to the present. Topics include explanations of crime as a moral, biological, and social phenomenon; crime in the ancient, medieval, and modern age; alternative “informal” or “non-western” approaches to criminal justice; criminal trials as public spectacles; political trials and war crimes; impact of race and gender hierarchies; debates about death sentence, imprisonment, and corporal punishment. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** HIST 072b, The History of World History** Valerie Hansen
How the great historians of ancient Greece, Rome, China, the Islamic world, and nineteenth-century Europe created modern historical method. How to evaluate the reliability of sources, both primary and secondary, and assess the relationship between fact and interpretation. Using historical method to make sense of our world today. Strategies for improving reading, writing, and public speaking skills. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** HIST 101Ja, History of Incarceration in the U.S.** Regina Kunzel
This course explores the history of incarceration in the U.S. over more than two centuries. Among the topics we explore are the carceral conditions of slavery; the rise of the penitentiary and racial control; convict leasing and other forms of prison labor; the prisoners’ rights movement in the late 1960s and early 1970s; the effects of “welfare reform,” the “war on drugs” and the “war on crime” on the mass incarceration of the late twentieth century; immigration detention; and the privatization and globalization of carceral practices. WR, HU

HIST 107b / AMST 133b / ER&M 187b, Introduction to American Indian History

Ned Blackhawk

Survey of American Indian history, beginning with creation traditions and migration theories and continuing to the present day. Focus on American Indian nations whose homelands are located within the contemporary United States. Complexity and change within American Indian societies, with emphasis on creative adaptations to changing historical circumstances. HU

*** HIST 114Jb, Women, Gender, and Work in United States History** Staff

This course examines the histories of women, gender, and work in modern American history. We investigate the following questions: How is work a gendering experience? How have historians of women and gender expanded and redefined the category of work? What is the relationship between gender and notions of value and skill? We examine forms of waged and unwaged labor, including domestic, intimate, emotional, consumer, and sexual labors. We consider how questions of work, labor, and gender intersect with the categories of race, sexuality, empire, disability, religion, and age. We also consider how diverse groups of women understood their work experiences, negotiated competing responsibilities and expectations, and struggled to transform working conditions and address social problems. WR, HU

*** HIST 119Ja / AMST 453a, 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 126Jb, 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 132Jb / AFAM 422b, Plantation Societies in the Greater British Caribbean 1627-1761** Erin Trahey

This upper level writing and reading intensive seminar considers the development of 'slave societies' in the Greater British Caribbean region from 1627 to 1761. In this course, we explore the development and evolution of the plantation economies and societies of Barbados, Jamaica, and South Carolina, and the shift to a racialized form of slavery in America, first codified in the Barbados Slave Code of 1661. Drawing on a wide range of sources, we explore themes including: the Atlantic slave trade, the consolidation of African slavery in the Americas, divisions of labor on sugar and rice plantations, internal marketing economies, spiritual practices of the enslaved and slave resistance and revolt. WR, HU

* **HIST 133Jb, The Creation of the American Politician, 1789–1820** Joanne Freeman

The creation of an American style of politics: ideas, political practices, and self-perceptions of America's first national politicians. Topics include national identity, the birth of national political parties, methods of political combat, early American journalism, changing conceptions of leadership and citizenship, and the evolving political culture of the early republic. WR, HU

* **HIST 134Jb, 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 135b / ECON 182b, American Economic History Staff

The growth of the American economy since 1790, both as a unique historical record and as an illustration of factors in the process of economic development. The American experience viewed in the context of its European background and patterns of industrialization overseas. After introductory microeconomics. WR, SO

* **HIST 135Ja, 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 137Ja / AFAM 227a / AMST 227a / ER&M 349a, From the Voting Rights Act to #blacklivesmatter** Ferentz Lafargue

This course explores the period beginning from 1964 through the emergence of the #blacklivesmatter movement in 2013. Key concepts covered in this course include the Black Panther Party and rise of the Black Power movement; political campaigns of Shirley Chisholm, Jesse Jackson, and Barack Obama. The seminar concludes with an examination of the #blacklivesmatter movement and broader efforts addressing mass incarceration, poverty, and opportunity gaps in education. HU

* **HIST 140Ja / EDST 217a, History of American Education** Rachel Rosenberg

Is education a right of every citizen as part of a democratic process? Is it a form of control whereby those with power shape new generations? A way to open access and create meritocracy? A limited resource used to shape the nation? In this course we interrogate these questions, exploring the goal and purpose of American education by various interest groups and different points throughout American history. Keeping both history and our current moment in mind, we consider how our education system has come to be the way it is, and where there were places to make other choices—as well as how these other choices might shed light on possible policy implications today. EDST 110 recommended. HU

* **HIST 145Jb / AFAM 452b, U.S. History Wars: Public History and the Battles Over the Past** Anna Duensing

This seminar introduces students to the theories and practices of public history in the U.S. context, exploring the possibilities and challenges of researching, crafting, and sharing historical narratives beyond the traditional confines of the classroom. Our focus

lies in a series of charged topics and case studies – so called “battles over the past” – that shed light on contentious debates and ongoing problems in public history work. Students learn to think in greater depth about power and the production of history and the pitfalls produced by everyday peoples’ encounters with the past. In turn, they get a sense of how actors with a variety of overlapping and competing interests and investments – historians, educators, survivors, veterans, funders, descendants, activists, and organizers – have contributed to and significantly altered public engagement with the past. With a considerable focus on these last two groups, this course seeks to highlight the power of everyday people in addressing the long-term impact and erasures of anti-Black and racial-colonial violence in the United States and their grassroots efforts to expose the role of history itself in upholding white supremacy and the status quo. HU

* **HIST 148Jb / AFAM 210b / AMST 445b, Politics and Culture of the U.S. Color Line**
Matthew Jacobson

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

* **HIST 150Jb / HSHM 406b, Healthcare for the Urban Poor** Sakena Abedin
Exploration of the institutions, movements, and policies that have attempted to provide healthcare for the urban poor 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 151Jb / AMST 422b / ER&M 435b, Writing Tribal Histories** Ned Blackhawk
Historical overview of American Indian tribal communities, particularly since the creation of the United States. Challenges of working with oral histories, government documents, and missionary records. WR, HU

* **HIST 153Jb / HSHM 488b, The History of Drugs and Addiction in Twentieth Century America** Marco Ramos

Virtually every American today “does” drugs. As a nation, our drug use ranges from everyday activities, such as drinking coffee or beer, to combating illnesses with prescription medications, to using illegal drugs for recreation. This course follows a loose chronology beginning in the early twentieth century and ending in the present day. Instead of focusing on the biography of a single drug, or class of drugs, this course incorporates a wide range of substances, including alcohol, cigarettes, pharmaceuticals, and narcotics. For each session, students read a selection of essays, book chapters, and primary source material. Through these readings, we discuss how certain ways of using and selling drugs have been sanctioned and encouraged, while others have been pathologized as addiction or criminalized. We explore how drug definitions are constructed, how they shift over time, how they affect (and are affected by) people who use, sell, and regulate drugs. We also trace how the medicalized concept of “addiction” emerged in the twentieth century and how this concept intersected with societal anxieties about race, immigration, indigeneity, and gender. Throughout the course, films, images, music, and television episodes are presented as objects of analysis to provide insight into the cultural lives of drugs. As a group, we discuss how historians have approached this subject, assess their sources and assumptions, and consider the

choices they have made in researching and writing. Students are expected to apply these lessons and demonstrate the ability to think and write critically about the history of drugs. WR, HU

*** HIST 154Ja or b, Neighboring Democracies: Representative Politics in the United States and Canada, 1607-Present** Brendan Shanahan

This seminar examines how representative politics have evolved in the United States and Canada from the turn of the seventeenth century to the present. Students learn diverse ways in which forms of liberal democracy—republicanism and constitutional monarchy in particular—have emerged in North America, how processes of democratization have operated, and the degree to which representative governments in Canada and the U.S. borrow from and emerge out of common and/or disparate contexts. Special emphasis is placed on—but is not limited to—the history of suffrage and voting rights in the United States and Canada. WR, HU

*** HIST 160Jb, The United States & the Pacific World** Staff

We often think of the United States as a nation that spans “from sea to shining sea.” But what about the sea beyond? What role have the Pacific Ocean and its peoples played in the history of the United States and vice versa? In this course, we go beyond “sea to shining sea” to highlight the importance of the Pacific World to U.S. history from the founding to the present. In addition to content, this course offers a number of skills workshops which introduce students to the components of writing history. WR, HU

*** HIST 163Ja / HSHM 419a, Madness and Decolonization** Marco Ramos

This seminar traces the history of psychiatry through its encounters and entanglements with colonial and postcolonial power. We begin with a discussion of how psychiatry has been used as an imperial tool of control in the 18th and 19th centuries. We pay particular attention to colonial scientific encounters with Indigenous and enslaved people, and how the psychiatric pathologization of Indigeneity and Blackness informed the construction of settler European whiteness. Then, we move to decolonization in the twentieth century to explore the emergence of international mental health, as former colonies transitioned to independent states. We discuss the attempts of African and Latin American thinkers, such as Frantz Fanon and Ignacio Martín-Baró, to use psychiatry for the liberation of oppressed groups in emerging postcolonial spaces. The seminar finishes with a discussion of the recent emergence of the global mental health movement and calls from former patients, BIPOC and disability activists, and others to “decolonize mental health” so that it serves—rather than harms—those traditionally marginalized by Western psychiatry. Throughout the course, students learn to trace the contours of psychiatry and decolonization through a variety of sources, including movies, music, photography, and monographs. WR, HU

*** HIST 164Ja, 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 165a / AMST 199a, The American Century Beverly Gage

United States politics, political thought, and social movements in the 20th century. Pivotal elections and political figures (Wilson, Roosevelt, Nixon, Reagan) as well as politics from below (civil rights, labor, women’s activism). Emphasis on political ideas such as liberalism, conservatism, and radicalism, and on the intersection between

domestic and foreign affairs. Primary research in Yale archival collections. Students who have already completed HIST 136J must have the instructor's permission to enroll in this course, and will perform alternate readings during some weeks. HU

HIST 166b / AMST 299b / ER&M 299b, The History of Right Now Matthew Jacobson

Historiographic narrative of United States history over the past century and critical/methodological practices of thinking historically and of identifying ways in which our present has been conditioned by historical legacies, both momentous and subtle. Topics include the New Deal, WWII, the arms race, Reaganomics, and 9/11 in terms of their lasting influence on American conditions in the present. HU RP

*** HIST 167Ja / PLSC 209a, Congress in the Light of History** David Mayhew

This course begins by studying analytic themes, including congressional structure, incentives bearing on members and parties, conditions of party control, supermajority rules, and polarization, followed by narrative works of major political showdowns entailing Congress such as those in 1850, 1876-77, 1919 (defeat of the Versailles Treaty), 1937 (defeat of court-packing), 1954 (the McCarthy-Army hearings), 1964 (civil rights), 1973-74 (Watergate), and 1993-94 (defeat of health care). Students also examine a series of policy performances, for the better or the worse in today's judgments, ranging from early state-building through reacting to the Great Depression, constructing a welfare state, and addressing climate change. This is a reading course and does not accommodate senior essays. SO

*** HIST 168Jb, 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 183a / AMST 272a / ER&M 282a / WGSS 272a, Asian American History, 1800 to the Present Mary Lui

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

HIST 187b / AFAM 162b / AMST 162b, African American History from Emancipation to the Present Elizabeth Hinton

An examination of the African American experience since 1861. Meanings of freedom and citizenship are distilled through appraisal of race and class formations, the processes and effects of cultural consumption, and the grand narrative of the civil rights movement. WR, HU

*** HIST 188Jb, The History of Central America and the Border Crisis** Greg Grandin

This seminar attempts to provide historical context to the ongoing crisis at the U.S. Mexican-border, with a special focus on Central American migration. The class takes a long view, starting with the sources of internal migration in the late 19th and early 20th century before moving on to an examination of migration north to the United

States. It deals with topics related to U.S. military interventions, civil wars, political repression, economic policies, Cold War politics, labor, family relations. During the second half of the semester, we deal with the post-Cold War period and triangulate between the economic restructuring of North America, the militarization of the border and immigration policy, and the escalating war on drugs and cartel violence. WR, HU

HIST 199b / AMST 236b / EVST 318b / HSHM 207b, American Energy History Paul Sabin

The history of energy in the United States from early hydropower and coal to present-day hydraulic fracturing, deepwater oil, wind, and solar. Topics include energy transitions and technological change; energy and democracy; environmental justice and public health; corporate power and monopoly control; electricity and popular culture; labor struggles; the global quest for oil; changing national energy policies; the climate crisis. WR, HU

HIST 202a, European Civilization, 1648–1945 John Merriman

An overview of the economic, social, political, and intellectual history of modern Europe. Topics include the rise of absolute states, the scientific revolution, the Enlightenment, the French Revolution and Napoleon, the industrial revolution, the revolutions of 1848, nationalism and national unifications, Victorian Britain, the colonization of Africa and Asia, fin-de-siècle culture and society, the Great War, the Russian Revolution, the Europe of political extremes, and World War II. HU

HIST 205a / CLCV 205a, Introduction to Ancient Greek History Jessica Lamont

Introduction to Greek history, tracing the development of Greek civilization as manifested in the political, military, intellectual, and creative achievements from the Bronze Age through the end of the Classical period. Students read original sources in translation as well as secondary scholarship to better understand the rise and fall of the ancient Greeks—the civilization at the very heart of Western Civilization. HU

* **HIST 209Ja, Revolt and Rebellion in Medieval Europe** Burton Westemeier

This seminar surveys revolts and rebellions in Europe and the Mediterranean, c. 1100-1400. Students learn how to analyze and interpret a range of primary source materials in translation including chronicles, letters, poems, and documents. Students also encounter and apply theoretical approaches to broader themes such as “the crowd,” modes of resistance, and violence as a historical phenomenon. Since this is a writing seminar, we focus throughout the course on developing a writing process and honing the skills used in making historical arguments. WR, HU

* **HIST 210Jb / HUMS 224b, 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 211b, The Birth of Europe, 1000-1500 Staff

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

*** HIST 212Jb / HUMS 313b, Philosophy of Dissent in Central and Eastern Europe**

Marci Shore

This is a seminar in the field of European intellectual history, based on primary sources. It focuses on how philosophers, novelists, sociologists, and other thinkers developed and articulated a philosophy of dissent under communism. More specific topics include the relationships between temporality and subjectivity and between truth and lies, and the role that existentialism played in formulating philosophical critiques of repression. Readings consist of a mixture of philosophical and literary works from the Soviet Union, East Germany and the lands in-between. Potential authors include Merab Mamardashvili, Danilo Kiš, Józef Tischner, Adam Michnik, Jacek Kuro#, Ladislav Hejdanek, Václav Havel, Jan Patočka, Leszek Kołakowski, Gajo Petrovi#, Norman Manea, Lev Kopelev, Igor Pomerantsev, Tomas Venclova. HU

*** HIST 215Jb, The Art of Biography** John Gaddis

A comparative examination of successful as well as unsuccessful biographies, intended to identify both principles and pitfalls. HU

HIST 217a / CLCV 206a / HUMS 144a, The Roman Republic Andrew Johnston

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

HIST 218b / CLCV 207b, 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

HIST 219a / ER&M 219a / JDST 200a / MMES 149a / RLST 148a, Jewish History and Thought to 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

*** HIST 220Jb, 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 222Jb / RSEE 222b, 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 225b / CLCV 236b, Roman Law Noel Lenski
Basic principles of Roman law and their applications to the social and economic history of antiquity and to the broader history of international law. Topics include the history of persons and things, inheritance, crime and tort, and legal procedure. Questions of social and economic history and the history of jurisprudence from the fifth century B.C.E. to the present. HU

* **HIST 225Ja, Perfect Worlds? Utopia and Dystopia in Western Cultures** Maria Jordan
This course explores the history of utopia and the ways in which societies at different times defined and conceived alternative or ideal worlds. It explores the relationship between real historical conditions and the models of utopia that were elaborated. By examining classic texts like Plato and Thomas More, as well as fictional accounts, students discuss the relationship between utopias and dystopias. The course also discusses how the crises of the last century, with WWII, the fall of the Soviet Union, and the difficulties of global capitalism provoked what some people now consider to be a crisis of utopian thought or, a moment of a redefinition of utopias as more pragmatic, inclusive, and egalitarian of societies. WR, HU

* **HIST 226Ja / JDST 370a / RLST 231a, Jews and Christians in the Formation of Europe, 500-1500** Ivan Marcus
This seminar studies topics related to the interactions between medieval Jewish communities and Christian leaders and social groups. Political, social, economic, religious, and material features of medieval Jewish-Christian encounters are discussed. WR, HU RP

* **HIST 228Jb, Corporations and the State in Early Modern Political Thought and Practice** Staff
This course explores the role of corporations in European state and empire building during the seventeenth and eighteenth centuries. Students learn about the historical origins and development of corporations during this period as well as the primary currents of European political and legal thought about corporate sovereignty. By the end of the course, students are able to situate contemporary debates about the relationship between corporations and states within a *longue durée* historical context encompassing diverse conceptions and practices of corporate political power. WR, HU

HIST 229a, From Oligarchy to Democracy in Britain, 1780-1914 Stuart Semmel
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

* **HIST 231Ja, The Dark Years: Collaboration and Resistance in Vichy France** John Merriman

The concomitants of collaboration and resistance during Vichy France, 1940–44. Topics include the fall of France in 1940; the return of Pétain's "National Revolution" and its continuities with the French Right during the Third Republic; the extent and nature of resistance (in the context of pre-World War II politics); and the memory of the Vichy years and its influence on subsequent French political life. WR, HU

HIST 236a / HSHM 226a, The Scientific Revolution Ivano Dal Prete

The changing relationship between the natural world and the arts from Leonardo to Newton. Topics include Renaissance anatomy and astronomy, alchemy, natural and geo history. HU

* **HIST 236Ja / HUMS 323a, 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 242Jb / CLCV 319b / MGRK 300b / WGSS 293b, 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 245Ja or b / GBLB 289a or b / PLSC 431a or b, War and Peace in Northern Ireland** Bonnie Weir

Examination of theoretical and empirical literature in response to questions about the insurgency and uneasy peace in Northern Ireland following the peace agreement of 1998 which formally ended the three-decade long civil conflict known widely as The Troubles and was often lauded as the most successful of its kind in modern history. Consideration of how both the conflict and the peace have been messier and arguably more divisive than most outside observers realize. SO

HIST 246b / EVST 189b, The History of Food Paul Freedman

The history of food and culinary styles from prehistory to the present, with a particular focus on Europe and the United States. How societies gathered and prepared food. Changing taste preferences over time. The influence of consumers on trade, colonization, and cultural exchange. The impact of colonialism, technology, and

globalization. The current food scene and its implications for health, the environment, and cultural shifts. HU

* **HIST 248Ja / JDST 293a / RLST 214a, Introduction to Modern Jewish Thought** Elli Stern

An overview of Jewish philosophical trends, movements, and thinkers from the seventeenth century to the twenty-first. Topics include enlightenment, historicism, socialism, secularism, religious radicalism, and Zionism. HU

HIST 252a / JDST 340a, Political History of European Jewry, 1589–1897 David Sorkin

The reshaping of political principles that governed Jewish life in the European diaspora during the modern period. The Jews' internal traditions of political self-understanding and behavior; the changing political status of Jews in Europe; Jewish political participation in European society. HU

HIST 254b / GMAN 208b, 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

HIST 255a, Imperial Russia, 1801-1922 Sergei Antonov

Russian Empire from the Napoleonic Wars to the Revolution and Civil War of 1917-1922. Main themes include autocratic political culture and challenges of liberalism, conservatism, nationalism; institutions and practices of serfdom and the development of capitalism and industrialization; main cultural trends from Romanticism to Silver Age; great-power politics, the "Great Game" competition against Britain, and the Eastern Front of the First World War. The three Russian revolutions of 1905 and 1917. Émigré culture and politics after 1917, politics of remembering imperial Russia in the twentieth and twenty-first century. HU

* **HIST 256Jb / HUMS 264b, Imagining the Body Politic: Constitutional Art and Theory from Antiquity to the Present** Staff

Do visual representations of social and political principles have a peculiar power to produce, reproduce, and disturb social and political relations? To what extent do some works of political theory seem to presuppose an imaginative construct, in particular one based on human bodies and their parts? Can we identify the birth of the modern state through an examination of key images of the body politic? Have the machine or network or program taken over the function of the body metaphor in more recent times? Does visualizing the principles and orders of society and politics elicit new critical awareness and reaction, or blindness and obedience? Does republican art differ fundamentally in this regard from monarchical – or fascist or communist or anarchist or neoliberal – art? HU

* **HIST 258Jb, Unmaking the British Empire: 1850-2010** Rohit De

At the end of the 19th century, the British Empire stood as the largest and most powerful state in the world with an imperial network that stretched across the globe. This was an Anglophile world order defined by the markets, connections and ideologies of the British imperial enterprise. By the end of the next century, a different story was to be told. The British Empire had come undone and instead a new age of

nation-states was firmly underway. The ideological legitimacy of British imperialism had been relentlessly challenged and the myth of the white man's burden severely undermined if not completely debunked. How did this come to be? This is an advanced seminar on the global history of decolonization in the British Empire. HU

* **HIST 260Jb / HSHM 468b, 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 263a, Eastern Europe to 1914 Timothy Snyder
Eastern Europe from the medieval state to the rise of modern nationalism. The Ottoman Empire, the Polish-Lithuanian Commonwealth, the Hapsburg monarchy, and various native currents. Themes include religious diversity, the constitution of empire, and the emergence of secular political ideologies. HU

HIST 264b / ER&M 263b / RSEE 268b, Eastern Europe since 1914 Timothy Snyder
Eastern Europe from the collapse of the old imperial order to the enlargement of the European Union. Main themes include world war, nationalism, fascism, and communism. Special attention to the structural weaknesses of interwar nation-states and postwar communist regimes. Nazi and Soviet occupation as an age of extremes. The collapse of communism. Communism after 1989 and the dissolution of Yugoslavia in the 1990s as parallel European trajectories. HU

* **HIST 267Jb / JDST 300b, The Holocaust in Contemporary Culture and Politics** Elli Stern

This course examines public debates and controversies over the appropriate response to the Holocaust over the past half century. We begin by looking at the context of the beginnings of Holocaust consciousness, paying special attention to the trial of Adolf Eichmann, the Six Day War in Israel, and the Civil Rights Movement. We explore the works of popular authors who attempted to draw particular or universal lessons from the history of the Holocaust, such as Hannah Arendt and Emil Fackenheim, as well as major representations of the Holocaust on TV and film, such as the NBC miniseries "Holocaust" and Claude Lanzmann's documentary "Shoah." We then move to a study of the controversies surrounding Holocaust education, including debates around the Holocaust museum in Washington, DC, the memorial to murdered Jews in Berlin, and Jewish tourist sites in post-communist Eastern Europe. The final part of the seminar is dedicated to the most recent scholarly arguments about the "uniqueness" of the Holocaust, the relationship of the Holocaust to other genocides and of Jews to other victims, and the parallels between contemporary and historic antisemitism. HU

* **HIST 268Ja / JDST 351a / PLSC 466a / RLST 324a, 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 269Jb, History and Holocaust Testimony** Carolyn Dean

The history and memoirs of Holocaust testimony. How victims' experiences are narrated and assessed by historians. Questions regarding memory and history. WR, HU

HIST 271a / HUMS 339a / RSEE 271a, European Intellectual History since Nietzsche

Marci Shore

Major currents in European intellectual history from the late nineteenth century through the twentieth. Topics include Marxism-Leninism, psychoanalysis, expressionism, structuralism, phenomenology, existentialism, antipolitics, and deconstruction. HU

*** HIST 277Ja, Memory and History in Modern Europe** Jennifer Allen

An interdisciplinary study of memory as both a tool in and an agent of modern European history. Collective memory; the media of memory; the organization and punctuation of time through commemorative practices. Specific themes vary but may include memory of the French Revolution, the rise of nationalism, World Wars I and II, the Holocaust, decolonization, the revolution of 1968, the fall of the Berlin Wall, and the end of the Cold War. WR, HU

HIST 280a / ITAL 315a / RLST 160a, 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

*** HIST 289Ja / HSAR 399a / HSHM 407a / HUMS 220a, Collecting Nature** Paola Bertucci

A history of museums before the emergence of the modern museum. Focus on: cabinets of curiosities and Wunderkammern, anatomical theaters and apothecaries' shops, alchemical workshops and theaters of machines, collections of monsters, rarities, and exotic specimens. WR, HU

HIST 290a / RSEE 225a, Russia from the Ninth Century to 1801 Paul Bushkovitch

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

*** HIST 294Ja / MGRK 305a, The Age of Revolution** Paris Aslanidis

The course is a comparative examination of the international dimensions of several revolutions from 1776 to 1848. It aims to explore mechanisms of diffusion, shared themes, and common visions between the revolutionary upheavals in the United States, France, Haiti, South America, Greece, and Italy. How similar and how different were these episodes? Did they emerge against a common structural and societal backdrop? Did they equally serve their ideals and liberate their people against tyranny? What was the role of women and the position of ethnic minorities in the fledgling nation-

states? As the year 2021 marks the bicentennial of the Greek Revolution of 1821, special attention is given to the intricate links forged between Greek revolutionary intellectuals and their peers in Europe and other continents HU

* **HIST 295Ja / ER&M 279a / HUMS 286a / PHIL 433a, Mass Incarceration in the**

Soviet Union and the United States Timothy Snyder and Jason Stanley
The Franke Seminar. An investigation of the experience and purposes of mass incarceration in the Soviet Union and the United States in the twentieth century. Incarceration is central to the understanding, if not usually to the self-understanding, of a society. It is thus a crucial aperture into basic questions of values and practices. This course proposes a frontal approach to the subject, by investigating two of the major carceral systems of the twentieth century, the Soviet and the American. Intensive reading includes first-person accounts of the Gulag and American prison as well as scholarly monographs on the causes of mass incarceration in different contexts. Brief account is taken of important comparative cases, such as Nazi Germany and communist China. Guest lectures and guest appearances are an important element of our teaching. HU

HIST 299b, History of the Supernatural from Antiquity to Modernity Carlos Eire

This survey course aims to provide an introduction to ancient, medieval, and early modern Western beliefs in supernatural forces, as manifested in saints, mystics, demoniacs, ghosts, witches, relics, miracles, magic, charms, folk traditions, fantastic creatures and sacred places. Using a wide range of primary sources and various historical methodologies, our aim is to better understand how beliefs and worldviews develop and change and the ways in which they shape and determine human behavior.

HU

* **HIST 299Ja / HUMS 192a, Intellectuals and Power in Europe** Terence Renaud

The role of intellectuals in politics, with a focus on social, cultural, and political upheavals in Europe during the nineteenth and twentieth centuries. Whether intellectuals betray a higher spiritual calling when they enter politics or merely strive to put their own theories into practice. Modern answers to the question of why ideas and intellectuals matter. HU

* **HIST 302Ja, Korea and the Japanese Empire in Critical Contexts** Hannah Shepherd

This course addresses critical moments of contact, conflict, and connection in the modern histories of Korea and Japan. Each week our discussion and readings focus on a specific event, before looking at the wider contexts involved and historical debates they have produced. This is not a comparative study of the histories of the different countries, but a chance to focus on themes – nationalism, colonial oppression, collaboration, war, identity – which continue to shape both relations between Japan, South Korea and North Korea, and the work of historians today. WR, HU

* **HIST 303Ja / EAST 303a, Hong Kong and China: A Cross-Border History** Denise

Ho

This departmental seminar studies the historical development of Hong Kong and China in relation to each other, from the colonial and late imperial experience to their shared histories in national and political movements, from postwar industrialization to reform-era economic growth, culminating in the 1997 handover and its attendant political and economic integration. The readings from the first half of the semester come primarily from the literature in history, while the readings in the second half draw

from anthropology, economics, political science, and sociology. Each week readings include primary sources in or translated into English. WR, HU

*** HIST 305Ja / EAST 404a / RLST 359a, Faith in Law in East Asia: Beginnings to 1800** Staff

This course investigates law in East Asia from ancient times to 1800 from the perspective of belief. We debate treatises, codes, cases, and cultural products from across East Asia's legal traditions, tracing the lives they took on. We work to understand firsthand law in its diverse contexts. More fundamentally, we consider the many ways in which people formed beliefs about what "law" might be or do. We examine the philosophical and faith traditions—and the hopes and fears—through which law was articulated, justified, realized, and then immediately contested. Throughout, we ask: What does it mean to invest law with one's faith? How much of one's belief is law? How much does law depend on one's belief? What gave people pause about this over time? You develop your own answers, with an eye toward how all of this has been understood, misunderstood, and appropriated across cultures and time. So the next time you hear an analyst or government official explain something in East Asia as rooted in "a Confucian disdain for law," or "Japanese 'Justice,'" (feat. in NYT) you will be equipped to strike up a conversation about just how they arrived at that belief. HU

HIST 307a / EAST 301a, The Making of Japan's Great Peace, 1550–1850 Fabian Drixler

Examination of how, after centuries of war in Japan and overseas, the Tokugawa shogunate built a peace that lasted more than 200 years. Japan's urban revolution, the eradication of Christianity, the Japanese discovery of Europe, and the question of whether Tokugawa Japan is a rare example of a complex and populous society that achieved ecological sustainability. HU

*** HIST 309Jb / EAST 309b, Uses of the Past in Modern China** Denise Ho

Modern China's use of the past in state-sponsored narratives of nation, in attempts to construct heritage by elites and intellectuals, and in grassroots projects of remembrance. Theories on history and memory; primary sources in English translation; case studies from twentieth-century China. Interdisciplinary readings in art history, anthropology, cultural studies, and history. WR, HU

HIST 311a / CLCV 219a / NELC 311a, Egypt of the Pharaohs Nadine Moeller and Joseph Manning

Egypt was among the first centralized territorial states in the world, and, because Egyptian history offers us 4000 years of institutional development and change, the focus of this course is on the long-term development of the ancient Egyptian state, its institutions, and its culture. The course introduces students to the history and culture of ancient Egypt from the rise of the central state to the early Christian period. General historical trends, the relationship of Egyptian history to other contemporary ancient cultures, and the legacy of Egypt to the "West" are also considered. At the end of the course, students have an understanding of the material culture and the historical development of ancient Egypt, and an appreciation for the relationship of the ancient sources to the construction of ancient Egyptian history. HU

*** HIST 311Ja / MMES 303a, Social Movements in the Modern Middle East and North Africa** Staff

How have social movements and grassroots networks shaped politics, culture, and day-to-day realities in the contemporary Middle East and North Africa (MENA)? This seminar addresses such driving questions by way of readings and discussion on a range of movements and ideological currents in the MENA region from the late nineteenth century to present, including labor, socialism, feminism, Islamism, Third Worldism, and nationalism in its various forms. Moving between local, national, regional, and global perspectives, we explore the social and political contexts in which these movements developed; the various ways in which they negotiated structures of power; and their impact on culture, sociality, and politics. WR, HU

*** HIST 315Jb / EAST 403b, Japan and Germany, 1860 to the Present** Staff

This course examines the histories of Japan and Germany from the founding of the two as modern nation states through the present. Relatively latecomers compared to supposedly “normal” nation states like the United States, France, and the United Kingdom, both societies followed similar, sometimes connected paths. The course introduces students to connections between East Asia and Europe through the nineteenth and twentieth centuries and explores how the specific parallels and entanglements between Japan and Germany shaped the histories of both regions. The course emphasizes themes of race, gender, and empire. Students engage with texts in history, sociology, and anthropology to answer key questions about Japanese and German history with particular emphasis on the question: is there something “peculiar” about their histories that led them to similar outcomes? HU

*** HIST 317Ja / EAST 405a, Japanese History before 1600: Society and Economy** Staff

This seminar employs a topical approach to the social and economic history of Japan between about 800 and 1600. We begin with the roles of each social group, from emperor to outcast, and then explore critical issues including: disease and famine; the varied roles of women; cities and commerce; the human relationship to the environment; legal and extralegal crime and punishment; and contacts with Korea and China. HU

*** HIST 319Jb / EAST 319b, Tokugawa Japan and the Human Condition** Fabian Drixler

An exploration of what Tokugawa Japan can teach us about shared human challenges and the diverse solutions different societies have found for them. Topics include standards of physical beauty; loyalty; romantic love; naming and the power of words; animals, infants, and the boundaries of humanity; unspeakable truths and open secrets; concealed power and the power of concealment; permissible violence; acceptable disasters; and the relationship of the living with the dead. In their coursework, students are invited to draw on their knowledge of other times and places as they put Tokugawa Japan in comparative perspective. HU

HIST 321a / EAST 220a, China from Present to Past, 2021–960 Valerie Hansen
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. WR, HU

* **HIST 321Jb, Exploring the Silk Road** Valerie Hansen

A journey along the overland and sea routes that connected China, India, and Iran from 200–1000 CE and served as conduits for cultural exchange. The lives of merchants, envoys, pilgrims, and travelers interacting in cosmopolitan communities. Exploration of long-known and newly discovered archaeological ruins, along with primary sources in translation. WR, HU

* **HIST 324Jb / MMES 322b / SOCY 320b, World War I and the Making of the Modern Middle East** Jonathan Wyrzten

WWI fundamentally transformed the Middle East, unmaking the Ottoman Empire and unleashing competition among colonial and local actors to reshape region's political order that lasted well into the 1930s. This seminar examines what can be called the “Long Great War” in the Middle East. The first part examines the road to World War I and the course of the war in the Middle Eastern theater's principle fronts (Caucasus, Mesopotamia, Sinai/Syria, North Africa, Dardanelles). We then look at the period immediately following the October 1918 Mudros Armistice (that technically ended Allied/Ottoman hostilities). During this violent “Wilsonian Moment” in the Middle East, local aspirations for self-determination were articulated, reformulated, and argued locally and internationally while colonial actors – British, French, Italian, and Spanish – mobilized competing state-building projects. The last section of the course looks at the climax points of conflict between these competing projects in the mid to late 1920s – including the Great Syrian Revolt, the Rif War, Kurdish Revolts, Saudi wars of consolidation, and the Italo-Sanusi war in Libya – and how present-day political units were finally negotiated. We conclude discussing how the Long Great War continues to echo and resonate in contemporary upheaval in the Middle East a century later. HU, SO

* **HIST 325Ja / AMST 301a / ER&M 382a, Researching Mexican American Histories**
Stephen Pitti

A survey of recent scholarship on Mexican American history. Students write a research paper based on primary sources and explore issues related to migration, education, detention, religion, urban communities, ethnic politics, and youth activism since the mid-nineteenth century. Reading knowledge of Spanish preferred. HU

HIST 340b / AFST 340b, Africa in the Era of the Slave Trade Staff

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

* **HIST 344a, African Independence: A Cup of Plenty or a Poisoned Chalice?**

Benedito Machava

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

*** HIST 345Ja or b / ER&M 359a or b, Gender and the State in Latin America and the Caribbean** Staff

This seminar offers an introduction to historical constructions of gender identity and gendered politics in Latin America and the Caribbean from pre-colonial native societies into the twentieth century. We begin with an analysis of gender in the Inca empire and several lowland societies, focusing on spirituality, agriculture, and land tenure particularly. The arrival of Spanish colonialism brings tremendous and complex transformations to the societies that we consider; we analyze discourses of honor, as well as how various subjects navigated the violence and the transforming colonial state. Our readings turn to Caribbean slavery, where studies of gendered experiences of enslavement and resistance have grown considerably in recent decades. Building on these insights, we analyze the gendered experiences of abolition and inclusion into contentious new Latin American and Caribbean nations of the nineteenth century. In the twentieth century, we consider some of the most salient analyses of the growth of state power, including dictatorships, in multiple sites. Throughout we maintain an eye for principle questions about representation, reproduction, inclusion, political consciousness, sexuality, migration, kinship, and revolutionary struggle through a gendered lens. WR, HU

HIST 353b, 20th Century Japan: Empire & Aftermath Staff

In 1905, in a victory which shocked the world, Japan defeated Imperial Russia in a regional conflict over control of Korea. To many in Asia and the non-Western world, Japan looked like a new model of anti-Western, anti-imperial modernity. However, the ensuing decades would see this image contested. The expansion of Japan's political and economic power into East Asia over the first half of the twentieth century has shaped the region in ways still visible today. This course is split into three parts, each covering roughly two decades. First, we look at the legacies of Japan's Meiji Restoration and the development of what has been called an "Imperial Democracy" in early 20th century Japan. Next, we look at the crises which rocked Japan in the 1930s and marked a new era. Finally, we deal with the aftermath of empire – both in the immediate "postwar" era for Japan, and in the debates over imperial legacies and history which still reverberate in Japan and many of its former colonies today. HU

HIST 355a / LAST 355a, Colonial Latin America Stuart Schwartz

A survey of the conquest and colonization of Latin America from pre-Columbian civilizations through the movements for independence. Emphasis on social and economic themes and the formation of identities in the context of multiracial societies. HU

*** HIST 368Ja / AFST 324a / EP&E 317a / PLSC 324a, Nelson and Winnie Mandela**
Jonny Steinberg

A study of Nelson and Winnie Mandela's marriage and public careers and the political and philosophical questions the marriage raises. Students examine the Mandelas' conflicting ideas on race and on the colonial experience and compare them to those of Mohandas Gandhi and Franz Fanon. Students also read recent philosophical work on forgiveness and on violence in order critically to assess the politics of reconciliation that

so divided the Mandelas. The course examines the politics of global celebrity and the portrayal of men and women in public media.

* **HIST 374Jb / AFST 486b / HSHM 486b, African Systems of Thought** Nana Osei Quarshie

This seminar explores the effects of colonialism and post-colonial power relations on the production of scientific, medical, and embodied knowledge about Africa. The course focuses on three broad themes covered across four units. First, we read debates over the nature and definition of science and tradition. How have colonialism and post-colonial power relations defined the tasks of an African science? What does it mean to decolonize African thought or culture? Second, we examine the nature of rationality. Is reason singular or plural? Culturally-bound or universal? To what extent are witchcraft, African healing practices, and ancestor veneration rational practices? Is there a “traditional” rationality? Third, we explore the relationship between scientific representations, social practices, and local culture. What relationship exists between social practices and culturally shared categories of knowledge? Lastly, we examine the intersection of capital and medical expertise. How have shifting conceptions of value and capital, reshaped scientific and medical authority in Africa? WR, HU

HIST 375b / EAST 375b, China from Mao to Now Denise Ho

The history of the People's Republic of China from Mao to now, with a focus on understanding the recent Chinese past and framing contemporary events in China in historical context. How the party-state is organized; interactions between state and society; causes and consequences of economic disparities; ways in which various groups – from intellectuals to religious believers – have shaped the meaning of contemporary Chinese society. HU

HIST 381b / MMES 102b / NELC 102b / SOCY 102b, Introduction to the Middle East Jonathan Wyrzten

Introduction to the history, politics, societies, and cultures of the Middle East. Topics and themes include geopolitics, environment, state formation, roles of Judaism/Christianity/Islam, empire&colonialism, nationalism, regional & global wars, Palestine-Israel conflict, US and other Great Power intervention. HU, SO

* **HIST 381Ja / EAST 413a, Writing the Rise and Fall of the Qin Empire** Staff

This course is a survey of the history of the Qin empire from its pre-imperial origins to its fall in 207 BCE – with a twist. We learn about the Qin, but we also use the Qin as a case study for the writing of East Asian history. How do we know what we know about the past? What assumptions are we making when we read a primary document? What's the difference between primary and secondary sources? Instead of beginning with survey materials written by scholars, we start with so-called primary sources (in translation). We then look at excavated materials. With new materials coming to light nearly every month, the study of the Qin empire is an exciting and quickly changing field of study. There is likely be new evidence published during the course of the semester. HU

* **HIST 383Ja / AFAM 213a / AFST 481a / HSHM 481a, Medicine and Race in the Slave Trade** Carolyn Roberts

Examination of the interconnected histories of medicine and race in the slave trade. Topics include the medical geography of the slave trade from slave prisons in West Africa to slave ships; slave trade drugs and forced drug consumption; mental and

physical illnesses and their treatments; gender and the body; British and West African medicine and medical knowledge in the slave trade; eighteenth-century theories of racial difference and disease; medical violence and medical ethics. WR, HU

* **HIST 386Jb / EAST 416b, Childhood and Domesticity in East Asia** Staff

This course offers an overview of burgeoning studies of childhood and domesticity in East Asia to get us to think about childhood and domesticity as methodologies of studying East Asia and history in general. Instead of learning about children “as they were,” this course examines how childhood and domesticity were socially constructed. East Asia is our geographical focus, although this course also introduces students to relevant key works in studies of childhood in the United States and Europe. This course focuses on several key questions. How do studies of childhood and domesticity enhance, challenge, and/or broaden our understanding of East Asia? How were normative conceptions of childhood, domesticity, and family constructed and challenged throughout the 20th century? How does scholarship on childhood and domesticity help us understand our own experiences of childhood, family, and homes? How can we make connections between the familiar/mundane everyday life with more explicitly political issues, such as wars and economy? Through a transnational approach, we situate East Asia within the global, transnational circulation of ideas, people, money, and practices that continue to shape how we perceive and experience our childhood, family, and domesticity. HU

* **HIST 388Ja, 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 391Ja / AFST 385a / EP&E 350a / HLTH 385, Pandemics in Africa: From the Spanish Influenza to Covid-19** Staff

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 392Ja, 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 398Ja / MMES 300a / RSEE 329a / RUSS 329a, Introduction to Modern Central Asia** Staff

An overview of the history of modern Central Asia—modern-day Kazakhstan, Kyrgyzstan, Turkmenistan, Tajikistan, Uzbekistan, and the Xinjiang Uyghur Autonomous Region of the People’s Republic of China. This course shows Central Asia to be a pivotal participant in some of the major global issues of the 20th and 21st centuries, from environmental degradation and Cold War, to women’s emancipation and postcolonial nation-building, to religion and the rise of mass society. It also includes an overview of the region’s longer history, of the conquests by the Russian and Chinese empires, the rise of Islamic modernist reform movements, the Bolshevik victory, World War II, the *perestroika*, and the projects of post-Soviet nation-building. Readings in history are supplemented by such primary sources as novels and poetry, films and songs, government decrees, travelogues, courtly chronicles, and the periodical press. All readings and discussions in English. HU

* **HIST 403Jb / HSHM 473b, 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 408Jb, Global Water in the Modern Era: Capitalism, State Power, and Environmental Crisis** Staff

This course introduces students to the historical promises and perils of the modern hydraulic era using a global, comparative approach. Throughout the semester, we read a variety of case studies, arranged in a roughly chronological manner, that provide a vantage on structural and cultural similarities, as well as problems and cultural aspirations unique to particular places and times. WR, HU

HIST 416b / EPS 211b / EVST 211b / HSHM 211b, Global Catastrophe since 1750 Bill Rankin

A history of the geological, atmospheric, and environmental sciences, with a focus on predictions of global catastrophe. Topics range from headline catastrophes such as global warming, ozone depletion, and nuclear winter to historical debates about the age of the Earth, the nature of fossils, and the management of natural resources. Tensions

between science and religion; the role of science in government; environmental economics; the politics of prediction, modeling, and incomplete evidence. HU

* **HIST 426Ja / GLBL 398a, Yale and the World: Global Power, Local History** David Engerman

This course uses moments in the history of Yale University to shed light on the forms, functions, and trajectory of U.S. global power from the late 19th century through the early 21st century. Key episodes include missionary work in East Asia, scientific expeditions in South America, mobilization for war and Cold War, and the internationalization of the student body. Students investigate these episodes by reading scholarly work as well as archival sources, and through discussions with Yale faculty and staff. HU

* **HIST 429Ja / HSHM 412a, Laboratory Life** Staff

The laboratory is the iconic space of modern science, where unruly nature is tamed and controlled, and scientific facts are made. Through historical, ethnographic, and sociological approaches to lab science, this course explores how an obscure, secretive site for managing alchemical labor in medieval Europe became the globally dominant mode of producing universal experimental knowledge across the modern sciences. We consider issues of labor, skill and class; gender and race; pedagogy and the politics of profession; state, industrial, and corporate laboratories; secrecy and openness; place and geography; and the implication of labs in geopolitical webs of power, inequality, and exploitation. Undergraduate enrollment limited to juniors and seniors. WR, HU

* **HIST 431Ja / HIST 431, Pandemics, Protests, and Power: A History of 2020**

Michael Brenes

This course explores the history of the year 2020 through the themes of “pandemics, protests, and power.” We seek to examine the past in the present, looking at how American and international history since the end of the 19th century shaped the tumultuous events of 2020. We review the circumstances and timeline of events that led to the Covid-19 pandemic, mass protests against police brutality, and the outcome of the 2020 election through a historical perspective, covering such topics as the history of mass incarceration, racial inequality since the Civil War, the history of the conservative movement since the 1960s, American foreign policy since World War II, and the rise of neoliberal capitalism after the 1970s. By taking an expansive, historical approach to the events that made 2020 such a momentous year, we aim to answer the looming question: Where did 2020 come from? WR, HU

HIST 433a, The Twentieth Century: A World History Arne Westad

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

* **HIST 435Ja, Colonial Cities: A Global Seminar** Hannah Shepherd

Cities of empire, both imperial capitals and colonial outposts, played crucial roles in the reinforcement of racial hierarchies, the flow of goods, people, and capital, and the representation of imperial power. This course looks at histories of cities around the world in the age of empire, and how they were shaped by these forces. Students gain visual analysis and mapping skills, and learn about the history and theory of imperial, colonial and postcolonial cities, and how they still inform debates over the urban environment today. WR, HU

* **HIST 449Jb / HSHM 449b, Critical Data Visualization: History, Theory, and Practice** Bill Rankin

Critical analysis of the creation, use, and cultural meanings of data visualization, with emphasis on both the theory and the politics of visual communication. Seminar discussions include close readings of historical data graphics since the late eighteenth century and conceptual engagement with graphic semiology, ideals of objectivity and honesty, and recent approaches of feminist and participatory data design. Course assignments focus on the research, production, and workshopping of students' own data graphics; topics include both historical and contemporary material. No prior software experience is required; tutorials are integrated into weekly meetings. Basic proficiency in standard graphics software is expected by the end of the term, with optional support for more advanced programming and mapping software. HU

* **HIST 455Jb / GMAN 373b / HUMS 287b / WGSS 347b, Resistance in Theory and Practice** Terence Renaud

Exploration of the histories and theories of resistance in the modern world. How liberation movements, guerrillas, and oppressed groups appeal to resistance as an organizational strategy and as moral justification. Readings include Kant, Thoreau, Nietzsche, Luxemburg, Lenin, Gandhi, Fanon, Arendt, Marcuse, Foucault, A. Lorde, Said, and J. Butler. Themes include antifascism to terrorism; violence to nonviolence, the New Left to Black Lives Matter. HU

* **HIST 459Ja / EVST 228a / HUMS 228a / LITR 345a, 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 464Jb, Law and History** Rohit De and Sergei Antonov

The role of law and legal institutions in shaping everyday life. Ways in which societies throughout history have engaged with law, rules, and legal institutions, from the Roman Empire to Ottoman Egypt to the U.S. civil rights era. Methodologies and sources in the study of legal history. WR, HU

* **HIST 467Ja / HSHM 422a, Cartography, Territory, and Identity** Bill Rankin

Exploration of how maps shape assumptions about territory, land, sovereignty, and identity. The relationship between scientific cartography and conquest, the geography of statecraft, religious cartographies, encounters between Western and non-Western

cultures, and reactions to cartographic objectivity. Students make their own maps. No previous experience in cartography or graphic design required. WR, HU

* **HIST 469Ja / EP&E 302a / GLBL 259a / PLSC 391a, State Formation** Didac Queralt
Study of the domestic and international determinants of functional states from antiquity to date. Analysis of state-formation in Europe in pre-modern and outside Europe from colonial times to date. Topics include centralization of power, capacity to tax, and contract enforcement. SO

* **HIST 481Ja, Grand Narratives in Global History** Fabian Drixler
Analysis of recent attempts to find patterns and unifying narratives in the complexity of world history. Topics include the decline of violence, economic divergences and global inequality, geographic determinism, climate and history, human history and the biosphere, demographic and evolutionary perspectives on history, history as neurochemistry, and the shifting shape of world history from different geographical vantage points. WR, HU

* **HIST 483Ja / GLBL 344a / PLSC 161a, Studies in Grand Strategy II** Beverly Gage
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

HIST 485a / AMST 215a / HSHM 217a / HUMS 219a, Biomedical Futures and Michael Crichton's Monsters Joanna Radin

What forms of life have been produced by modern science? The literal life-changing technologies that began to emerge after the Second World War also provoked new anxieties. They expressed themselves in the speculative fiction of Michael Crichton in terms of monsters: the virus in *The Andromeda Strain*, the androids in *Westworld*, the velociraptors of *Jurassic Park*, and even the patients maimed by gunshot wounds in *ER*. Crichton wrote thrilling stories that also asked his readers to consider what monsters humans could make if they didn't stop to consider whether or not they should. This course examines the emergence of modern life science to consider what it would take to produce more life-sustaining futures. HU, SO

* **HIST 494a or b, Individual Writing Tutorial** Mark Peterson

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 495a or b and HIST 496a or b, The Senior Essay** Staff

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 497a or b, One-Term Senior Essay** Staff

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 019a, *Matters of Color / Color Matters* Staff

Color is a powerful element of visual representation. It can convey symbolic meaning, descriptive content, aesthetic values, and cultural connotations. This seminar seeks to explore practical, aesthetic, and conceptual facets of "color." A series of weekly modules are structured around the strengths of the rich special collections at Yale libraries and museums. Students are introduced to Yale librarians, curators, and conservators whose expertise will be an invaluable resource throughout their undergraduate years. The course incorporates hands-on sessions in keeping with making as a learning tool. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

HSAR 110a / ARCG 110a, *Introduction to the History of Art: Global Decorative Arts*

Edward Cooke

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

HSAR 150a / ARCH 272a / RLST 262a, *Introduction to the History of Art: Art and Architecture of the Sacred* Jacqueline Jung

A wide-ranging, cross-temporal exploration of religious images, objects, and architecture in diverse cultures, from ancient Mesopotamia to modern Manhattan. Buddhist, Christian, Hindu, Jewish, Muslim, and various polytheistic traditions are represented. Thematic threads include the human body; transformations of nature; death, memory, and afterlife; sacred kingship and other forms of political engagement;

practices of concealment and revelation; images as embodiments of the divine; the framing and staging of ritual through architecture. HU

HSAR 219b / AMST 197b / ARCH 280b / URBN 280b, American Architecture and Urbanism Elihu Rubin

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

HSAR 221b / RUSS 220b, Russian and Soviet Art, 1757 to the Present Molly Brunson

The history of Russian and Soviet art from the foundation of the Academy of the Arts in 1757 to the present. Nineteenth-century academicism, romanticism, and realism; the Russian avant-garde and early Soviet experimentation; socialist realism and late- and post-Soviet culture. Readings and discussion in English. HU TR

HSAR 285a, Italian Renaissance Art Morgan Ng

This course surveys the art of Renaissance Italy (c. 1420–1550) in its full breadth, including architecture, sculpture, and painting. Lectures situate artworks within broad cultural themes, while sections include the first-hand study of objects in the Yale University Art Gallery. Topics include the display of art in civic space; the influence of Roman antiquity on monumental architecture; the conception of nature in paintings and gardens; the representation of the human body in portraiture and heroic sculpture; the rise of women artists and patrons. The course scrutinizes acknowledged masterworks by Michelangelo, Leonardo da Vinci, and Raphael, in the artistic centers of Florence, Rome, and Venice. At the same time, it considers lesser known yet no less vibrant artistic sites, such as those in Southern Italy. It also draws map connections beyond Europe, revealing rich cultural exchanges with the Ottoman empire and the Americas. HU

HSAR 298a, Rembrandt Nicola Suthor

Rembrandt's art exerts strong impact on the beholder. How does this happen and how important are the materials used to produce the various works? Chronological study of the young to the late Rembrandt, with specific attention to the differences between his portrait, landscape, and historical works. HU

HSAR 326a / ARCH 260a, History of Architecture to 1750 Kyle Dugdale

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

HSAR 357a, Arts of Japan I Mimi Yiengpruksawan

Survey of major monuments in the visual arts of ancient and early medieval Japan with attention to the conditions and thought worlds of cultural production. Emphasis on the arts practices and philosophies of Buddhism and Shintō in juxtaposition with the courtly arts from narrative handscrolls to integrations of poetry and painting in landscape screens and picture albums. HU

HSAR 374a / FREN 375a, Icons in French Art Marie Girard

The purpose of the course is to focus on the emergence of some of the visual myths, which the large diffusion of pictures through all kind of media (prints, lithographs, photographs, ads) along the 19th century made possible. Based on a selection of works painted between Renaissance and 20th century, which have long been part of the French collections and belong for the most of them to the Musée du Louvre and the Musée d'Orsay, the course focuses on both the genesis of these pictures and the emotional, social, and political response they gained from the public audience when they appeared. Putting them in context and reading some of the main critical texts by Gautier, Baudelaire, Zola and Foucault among others, helps to understand what made Delacroix's *Liberté* or Millet's *Angelus* survive as emblems of the period and keys to French culture. That illuminates how artists shaped French history and sensibility through emblematic works which are still at the center of the visual culture today and how collective myths can grow. Prerequisite: French L5. L5, HU

*** HSAR 399a / HIST 289Ja / HSHM 407a / HUMS 220a, Collecting Nature** Paola Bertucci

A history of museums before the emergence of the modern museum. Focus on: cabinets of curiosities and Wunderkammern, anatomical theaters and apothecaries' shops, alchemical workshops and theaters of machines, collections of monsters, rarities, and exotic specimens. WR, HU

*** HSAR 401a, Critical Approaches to Art History** Morgan Ng

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 402a, Art and the Book in Modern Britain** Staff

In 1894, William Morris characterized the book as “the most important production of Art.” Based on close examination of peerless collections of works by Blake, Turner, the Pre-Raphaelites, and others at the YCBA and Beinecke, this course focuses on the book as a principal medium of British art—and the art of the British Empire—in the long nineteenth century (1780 – 1915), with a coda taking us to the present day. We consider William Blake's illuminated books, which radically blurred the line between text and image. We investigate, too, the book as a travel guide and virtual art gallery (where artists like J.M.W. Turner really made their living). The printed volume as a site of avant-garde experimentation, in which artist collectives bound themselves together—such as in the Pre-Raphaelite journal, *The Germ*, and in *Blast*, Vorticism's “little magazine”—are also explored. So, too, William Morris's Kelmscott books, which staged a protest against industrial capitalism. The illustrated book is also examined as a significant element in the culture of the British Empire, bringing vivid representations of the empire to readers in Britain, and circulating them around the world, while also promoting imperial ideologies that colonized peoples actively resisted—a process in which the book played a vital role. The course concludes with a session on twenty-first-

century artists who revisited the book as a site for creative experimentation and radical practice. HU

* **HSAR 410b / AMST 332b, Humbugs and Visionaries: American Artists and Writers Before the Civil War** Bryan Wolf

This course examines American literature and visual culture of the seventeenth, eighteenth, and nineteenth centuries. We look in particular at outliers, prophets, and self-promoters, from the radical Puritan writer Anne Bradstreet to popular entertainers like P. T. Barnum. Topics include: visibility and the public sphere; landscape and politics; genre painting and hegemony; race and identity; managerial culture and disembodied vision. Class trips to the Yale University Art Gallery and the Metropolitan Museum (New York). HU

* **HSAR 440a, Issues in Nineteenth-Century Sculpture** Christina Ferando

Survey of nineteenth-century European and American sculpture using concrete visual examples from Italy, France, England, and the United States to examine the formal structure of sculpture and contextualize the social and political circumstances of its production and reception. Focus on representation of the human figure and examination of issues of idealism and naturalism, as well controversies surrounding the use of color and gender/class signifiers. Use of collections in the Yale University Art Gallery and the Yale Center for British Art. Some familiarity with art history is helpful. HU

* **HSAR 441b / ENGL 329b / HUMS 371b / LITR 402b, The Picturebook: Euro-American and Japanese Traditions** Katie Trumpener

Examines the form, history, and preoccupations of the picturebook form from the eighteenth century to the present, juxtaposing Euro-American with Japanese picturebook traditions. HU

* **HSAR 457a, Japanese Gardens** Mimi Yiengpruksawan

Arts and theory of the Japanese garden with emphasis on the role of the anthropogenic landscape from aesthetics to environmental precarity, including the concept of refugium. Case studies of influential Kyoto gardens from the 11th through 15th centuries, and their significance as cultural productions with ecological implications. HU

* **HSAR 460a / ENGL 419a / HUMS 185a, 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. Formerly ENGL 247. WR, HU

* **HSAR 475a, Art and the Senses in Europe, 500-1700** Staff

How do we experience a work of art? Art history has long privileged vision as the primary sense for experiencing works of art but increasingly embraced art's engagement with touch, smell, sound, and even taste. This seminar explores historically grounded ways of thinking about sensory experience of art objects and material culture in premodern and early modern Europe (ca. 500 – 1700 CE). We meet in Yale collections, including Yale University Art Gallery (YUAG), Beinecke Rare Book and Manuscript Library, the Print Study Room of YUAG, and Cushing/Whitney Medical Library. We look closely at works of art across different media, from small luxury objects to

architectural monuments, and in a variety of materials, from stone to wax. We also examine a wide range of primary sources, such as scientific writings, courtly ceremonies, and accounts of religious experiences. Topics include: cultural history of the senses; senses and human cognition; pleasure and the bodily senses; multisensory aesthetics; function of various senses in art and ritual; sensory worlds of cultural encounters. We primarily focus on art and material culture of Europe, but our readings range more broadly. HU

*** HSAR 480a / WGSS 481a, Woman/Artist** Carol Armstrong

This seminar focuses on women artists of the 19th and 20th centuries in Western Europe and the United States, while also looking back to the Renaissance through the 18th centuries, and forward to our own "global" moment. Beginning with the advent of feminist art history, it moves chronologically, intertwining the history of women artists with such questions as: What are the pros and cons of singling out women artists? What were the institutional restraints on women's entering the the canon of "great" art? How did conceptions of "femininity," female agency, and the "male gaze" intersect with the history of art by women? How did women's roles as artist's patrons or models inflect their own or others' activities as artists? How did the political revolutions of the 18th, 19th, and 20th centuries change things for women artists? How did the public and private spheres of modernity shape the role of women in the story of "modernism"? How did the first, second, and third waves of feminism address the problem of the women artist? How did/do matters of sex and gender intersect with those of race and class in the identity politics of contemporary world art? What is feminist art? This class is offered in tandem with the YUAG exhibition "On the Basis of Art: 150 Years of Women at Yale," and culminates in a conference addressed to the two key terms of "Woman/Artist." HU

*** HSAR 487a / ER&M 384a, Art in the Anthropocene** Staff

There is widespread consensus that we are living in a state of emergency and ecological collapse. This seminar explores how contemporary artists are responding to the Anthropocene, a geological epoch defined by the impacts of human activity on the natural world. The converging crises of our present have revealed how structural inequality has created an uneven distribution of environmental risk along the lines of class, ethnicity, gender, and race. Engaging critical issues in the environmental humanities and focusing on the intersections of environmental and social justice, the course focuses on contemporary art from the 1970s to the present, with attention to how the legacies of colonization, empire, and the transatlantic slave trade shape the present. We consider how art bears witness to ecological crisis while exploring how arts worldmaking potential might help us imagine more just futures. Through a survey of contemporary art in the Anthropocene, we critically examine the interface between art, activism, and knowledge production. The course includes object-based study at the Yale Center for British Art, the Yale University Gallery, the Medical Historical Library and the Beinecke Library (dependent on Covid-19 policies). HU

*** HSAR 489a / CLCV 305a / GMAN 489a, Pathos-Figures: Affection-Images in the Visual Arts** Nicola Suthor

Images with high pathos inform our perception of human life and define our stance in the world. The seminar wants to foster a critical awareness of the formative power that pathos figures exert on our moral beliefs concerning human behavior. The course covers the timespan from Antiquity to Modernity in Western culture and deals with

historical moments that reflect different attempts to cultivate and temper strong emotions. We discuss the transfer of pathos and how the dissemination of eminent pathos figures of antiquity have shaped the imagery of the Western canon; we tackle with one of the most far-reaching concepts of art history, Aby Warburg's Pathos formula that encourages us to draw in broad strokes connecting lines of affection over centuries and different cultures; we look into the discourse on human suffering in Medieval times and how it has defined the Christian doctrine of the affective image; we have a close look at treatises of the 17th century that worked on theorizing human passions and discuss the Enlightenment perspective that aimed at interiorizing pathos by dint of the discourse of beauty; we discuss the Modern "close-up" and how it unfolds the moment of pure bodily presence as highly affective entity. We ask if we are in need of new pathos images that reflect our current emotional stakes, and how they might look. HU

* **HSAR 490b / FILM 320b, Close Analysis of Film** Oksana Chefranova

Close study of a range of major films from a variety of periods and places. Apart from developing tools for the close analysis of film, we consider such topics as genre and mode; the role of sound; cinema as a structure of gazes; remakes and adaptations; approaches to realism; narration and resistance to narration; film in relation to other moving image media; and the relationship of close analysis to historical contextualization and interpretation more generally. Prerequisite: FILM 150. HU

* **HSAR 493a / AMST 484a / ER&M 405a / FILM 402a / WGSS 462a, Visual Kinship, Families, and Photography** Laura Wexler

Exploration of the history and practice of family photography from an interdisciplinary perspective. Study of family photographs from the analog to the digital era, from snapshots to portraits, and from instrumental images to art exhibitions. Particular attention to the ways in which family photographs have helped establish gendered and racial hierarchies and examination of recent ways of reconceiving these images. HU

* **HSAR 499a, The Senior Essay** Jacqueline Jung

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 005a / HIST 006a, Medicine and Society in American History** Rebecca Tannenbaum

Disease and healing in American history from colonial times to the present. The changing role of the physician, alternative healers and therapies, and the social impact of epidemics from smallpox to AIDS. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

HSHM 207b / AMST 236b / EVST 318b / HIST 199b, American Energy History Paul Sabin

The history of energy in the United States from early hydropower and coal to present-day hydraulic fracturing, deepwater oil, wind, and solar. Topics include energy transitions and technological change; energy and democracy; environmental justice and public health; corporate power and monopoly control; electricity and popular culture; labor struggles; the global quest for oil; changing national energy policies; the climate crisis. WR, HU

HSHM 211b / EPS 211b / EVST 211b / HIST 416b, Global Catastrophe since 1750 Bill Rankin

A history of the geological, atmospheric, and environmental sciences, with a focus on predictions of global catastrophe. Topics range from headline catastrophes such as global warming, ozone depletion, and nuclear winter to historical debates about the age of the Earth, the nature of fossils, and the management of natural resources. Tensions between science and religion; the role of science in government; environmental economics; the politics of prediction, modeling, and incomplete evidence. HU

HSHM 217a / AMST 215a / HIST 485a / HUMS 219a, Biomedical Futures and Michael Crichton's Monsters Joanna Radin

What forms of life have been produced by modern science? The literal life-changing technologies that began to emerge after the Second World War also provoked new anxieties. They expressed themselves in the speculative fiction of Michael Crichton in terms of monsters: the virus in *The Andromeda Strain*, the androids in *Westworld*, the velociraptors of *Jurassic Park*, and even the patients maimed by gunshot wounds in *ER*. Crichton wrote thrilling stories that also asked his readers to consider what monsters humans could make if they didn't stop to consider whether or not they should. This course examines the emergence of modern life science to consider what it would take to produce more life-sustaining futures. HU, SO

HSHM 226a / HIST 236a, The Scientific Revolution Ivano Dal Prete

The changing relationship between the natural world and the arts from Leonardo to Newton. Topics include Renaissance anatomy and astronomy, alchemy, natural and geo history. HU

* **HSHM 406b / HIST 150Jb, Healthcare for the Urban Poor** Sakena Abedin

Exploration of the institutions, movements, and policies that have attempted to provide healthcare for the urban poor 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

* **SHSM 407a / HIST 289Ja / HSAR 399a / HUMS 220a, Collecting Nature** Paola Bertucci

A history of museums before the emergence of the modern museum. Focus on: cabinets of curiosities and Wunderkammern, anatomical theaters and apothecaries' shops, alchemical workshops and theaters of machines, collections of monsters, rarities, and exotic specimens. WR, HU

* **SHSM 412a / HIST 429Ja, Laboratory Life** Staff

The laboratory is the iconic space of modern science, where unruly nature is tamed and controlled, and scientific facts are made. Through historical, ethnographic, and sociological approaches to lab science, this course explores how an obscure, secretive site for managing alchemical labor in medieval Europe became the globally dominant mode of producing universal experimental knowledge across the modern sciences. We consider issues of labor, skill and class; gender and race; pedagogy and the politics of profession; state, industrial, and corporate laboratories; secrecy and openness; place and geography; and the implication of labs in geopolitical webs of power, inequality, and exploitation. Undergraduate enrollment limited to juniors and seniors. WR, HU

* **SHSM 419a / HIST 163Ja, Madness and Decolonization** Marco Ramos

This seminar traces the history of psychiatry through its encounters and entanglements with colonial and postcolonial power. We begin with a discussion of how psychiatry has been used as an imperial tool of control in the 18th and 19th centuries. We pay particular attention to colonial scientific encounters with Indigenous and enslaved people, and how the psychiatric pathologization of Indigeneity and Blackness informed the construction of settler European whiteness. Then, we move to decolonization in the twentieth century to explore the emergence of international mental health, as former colonies transitioned to independent states. We discuss the attempts of African and Latin American thinkers, such as Frantz Fanon and Ignacio Martín-Baro, to use psychiatry for the liberation of oppressed groups in emerging postcolonial spaces. The seminar finishes with a discussion of the recent emergence of the global mental health movement and calls from former patients, BIPOC and disability activists, and others to “decolonize mental health” so that it serves – rather than harms – those traditionally marginalized by Western psychiatry. Throughout the course, students learn to trace the contours of psychiatry and decolonization through a variety of sources, including movies, music, photography, and monographs. WR, HU

* **SHSM 422a / HIST 467Ja, Cartography, Territory, and Identity** Bill Rankin

Exploration of how maps shape assumptions about territory, land, sovereignty, and identity. The relationship between scientific cartography and conquest, the geography of statecraft, religious cartographies, encounters between Western and non-Western cultures, and reactions to cartographic objectivity. Students make their own maps. No previous experience in cartography or graphic design required. WR, HU

* **SHSM 432b / ER&M 360b / HLTH 370b / SOCY 390b / WGSS 390b, Politics of Reproduction** Rene Almeling

Reproduction as a process that is simultaneously biological and social, involving male and female bodies, family formation, and powerful social institutions such as medicine, law, and the marketplace. Sociological research on reproductive topics such

as pregnancy, birth, abortion, contraception, infertility, reproductive technology, and aging. Core sociological concepts used to examine how the politics of reproduction are shaped by the intersecting inequalities of gender, race, class, and sexuality. WR, SO

*** HSHM 449b / HIST 449Jb, Critical Data Visualization: History, Theory, and Practice** Bill Rankin

Critical analysis of the creation, use, and cultural meanings of data visualization, with emphasis on both the theory and the politics of visual communication. Seminar discussions include close readings of historical data graphics since the late eighteenth century and conceptual engagement with graphic semiology, ideals of objectivity and honesty, and recent approaches of feminist and participatory data design. Course assignments focus on the research, production, and workshopping of students' own data graphics; topics include both historical and contemporary material. No prior software experience is required; tutorials are integrated into weekly meetings. Basic proficiency in standard graphics software is expected by the end of the term, with optional support for more advanced programming and mapping software. HU

*** HSHM 468b / HIST 260Jb, 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 470a or b, Directed Reading Staff

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 473b / HIST 403Jb, 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 476a / ENGL 248a / HUMS 430a / LITR 483a / PHIL 361a, Thought Experiments: Connecting Literature, Philosophy and the Natural Sciences** Paul Grimstad

The course looks closely at the intersection of literature, philosophy and natural science through the lens of the thought experiment. Do thought experiments yield new knowledge about the world? What role does narrative or scene setting play in thought experiments? Can works of literary fiction or films function as thought experiments? Readings take up topics such as personal identity, artificial intelligence, meaning and intentionality, free will, time travel, the riddle of induction, "trolley problems" in ethics and the hard problem of consciousness. Authors

may include Mary Shelley, Plato, Albert Einstein, Franz Kafka, H.G. Wells, Rene Descartes, Kazuo Ishiguro, Rivka Galchen, Alan Turing, Hilary Putnam, as well as films (*The Imitation Game*) and television shows (*Black Mirror*). Students should have taken at least one course involving close analysis of works of literature or philosophy. WR, HU

*** HSHM 481a / AFAM 213a / AFST 481a / HIST 383Ja, Medicine and Race in the Slave Trade** Carolyn Roberts

Examination of the interconnected histories of medicine and race in the slave trade. Topics include the medical geography of the slave trade from slave prisons in West Africa to slave ships; slave trade drugs and forced drug consumption; mental and physical illnesses and their treatments; gender and the body; British and West African medicine and medical knowledge in the slave trade; eighteenth-century theories of racial difference and disease; medical violence and medical ethics. WR, HU

*** HSHM 486b / AFST 486b / HIST 374Jb, African Systems of Thought** Nana Osei Quarshie

This seminar explores the effects of colonialism and post-colonial power relations on the production of scientific, medical, and embodied knowledge about Africa. The course focuses on three broad themes covered across four units. First, we read debates over the nature and definition of science and tradition. How have colonialism and post-colonial power relations defined the tasks of an African science? What does it mean to decolonize African thought or culture? Second, we examine the nature of rationality. Is reason singular or plural? Culturally-bound or universal? To what extent are witchcraft, African healing practices, and ancestor veneration rational practices? Is there a “traditional” rationality? Third, we explore the relationship between scientific representations, social practices, and local culture. What relationship exists between social practices and culturally shared categories of knowledge? Lastly, we examine the intersection of capital and medical expertise. How have shifting conceptions of value and capital, reshaped scientific and medical authority in Africa? WR, HU

*** HSHM 488b / HIST 153Jb, The History of Drugs and Addiction in Twentieth Century America** Marco Ramos

Virtually every American today “does” drugs. As a nation, our drug use ranges from everyday activities, such as drinking coffee or beer, to combating illnesses with prescription medications, to using illegal drugs for recreation. This course follows a loose chronology beginning in the early twentieth century and ending in the present day. Instead of focusing on the biography of a single drug, or class of drugs, this course incorporates a wide range of substances, including alcohol, cigarettes, pharmaceuticals, and narcotics. For each session, students read a selection of essays, book chapters, and primary source material. Through these readings, we discuss how certain ways of using and selling drugs have been sanctioned and encouraged, while others have been pathologized as addiction or criminalized. We explore how drug definitions are constructed, how they shift over time, how they affect (and are affected by) people who use, sell, and regulate drugs. We also trace how the medicalized concept of “addiction” emerged in the twentieth century and how this concept intersected with societal anxieties about race, immigration, indigeneity, and gender. Throughout the course, films, images, music, and television episodes are presented as objects of analysis to provide insight into the cultural lives of drugs. As a group, we discuss how historians have approached this subject, assess their sources and assumptions, and consider the

choices they have made in researching and writing. Students are expected to apply these lessons and demonstrate the ability to think and write critically about the history of drugs. WR, HU

*** HSHM 490a or b and HSHM 491a or b, Yearlong Senior Project** Staff

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 211 HGS no later than 5 p.m. on April 6, 2018, in the spring term, or no later than 5 p.m. on December 1, 2017, in the fall term. 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 492a or b, One-Term Senior Project** Staff

Preparation of a one-term senior project under the supervision of an HSHM faculty member, or of an affiliated faculty member with approval of the director of undergraduate studies. There will be a mandatory meeting at the beginning of the term for students who have chosen the one-term 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 492 during the fall term. December graduates enroll in HSHM 492 in the preceding spring term. Students planning to begin their project in the spring should notify the senior project director by the last day of classes in the fall term. Majors must submit a completed Statement of Intention form signed by the faculty member who has agreed to supervise the project to the HSHM administrator no later than September 9, 2019 (HSHM 492a), or January 17, 2020 (HSHM 492b). Blank statement forms are available in the HSHM Senior Project Handbook on the HSHM website. Students enrolled in HSHM 492 must submit a completed senior project to the HSHM administrator no later than 5 p.m. on December 2, 2019, in the fall term, or no later than 5 p.m. on April 6, 2020, in the spring term. 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.

Human Rights Studies (HMRT)

HMRT 100b / PLSC 148b, Theories, Practices, and Politics of Human Rights Jim Silk

Introduction to core human-rights issues, ideas, practices, and controversies. The concept of human rights as a philosophical construct, a legal instrument, a political tool, an approach to economic and equity issues, a social agenda, and an international locus of contestation and legitimation. Required for students in the Multidisciplinary Academic Program in Human Rights. SO

* **HMRT 400a, Advanced Human Rights Colloquium** Jim Silk

This course is the culminating seminar for Yale College seniors in the Multidisciplinary Academic Program in Human Rights (Human Rights Scholars). The goal of the colloquium is to help students conceive and produce a meaningful capstone project as a culmination of their work in the program. It is a singular opportunity for students to pursue in-depth research in human rights. Open only to Human Rights Scholars in their senior year and a requirement for completing the program.

HMRT 460a or b, Independent Study Staff

Readings in history, policy, theory, advocacy, and methodology of human rights; weekly tutorial and substantial term essay. Open to sophomores, juniors, and those seniors not intending it to fulfill a senior requirement.

* **HMRT 470a or b, Senior Independent Study** Staff

Readings in history, policy, theory, advocacy, and methodology of human rights; weekly tutorial and substantial term essay. RP

Humanities (HUMS)

* **HUMS 005a / NELC 005a, The Ancient Egyptian Empire of the New Kingdom** Nadine Moeller

For most of the duration of the New Kingdom (1550-1069 BCE), the ancient Egyptians were able to establish a vast empire and became one of the key powers within the Near East. This course is an introduction to the history, archaeology and literary sources of one of the most dynamic periods of ancient Egyptian history. We investigate the development of Egyptian foreign policies and military expansion, which affected parts of the Near East and Nubia to the south. We also examine and discuss topics such as ideology, imperial identity, political struggle and motivation for conquest and control of wider regions surrounding the Egyptian state as well as the relationship to other powers and their perspective on Egyptian rulers, as, for example, described in the famous Amarna letters, the world's earliest diplomatic correspondence. Throughout the semester, we consider the different sources that have survived in the archaeological and textual record for understanding Egypt's first empire within its ancient geopolitical context. All primary texts are read in translation. HU

* **HUMS 027a / LITR 027a, Six Pretty Good Selves** Ayesha Ramachandran and Marta Figlerowicz

Through the prism of thinking about the self, this course provides first-year students with an intensive introduction to studying the humanities at Yale. The course is anchored around six trans-historical models of thinking about selfhood: the ideal self, the lover, the revolutionary, the convert, the solipsist, and the social climber. We

range widely across genres, media, periods, and geographies: from Plato's *Symposium* to Machado de Assis's *Epitaph for a Small Winner*, from the ghazals of Hafez to the *Kamasutra*. We also make extensive use of Yale's rich manuscript archives, historical object collections, and art galleries and devote sustained attention to improving students' academic writing skills. Friday sessions will alternate between writing workshops and field trips to Yale collections. WR, HU 1½ Course cr

*** HUMS 029a / LITR 028a, 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). Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

*** HUMS 035b / HIST 025b / PLSC 035b, 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. Preregistration required; see under First-Year Seminar Program. SO

*** HUMS 061a / CLCV 051a / LITR 029a / THST 051a, Performing Antiquity** Pauline LeVen

This seminar introduces students to some of the most influential texts of Greco-Roman Antiquity and investigates the meaning of their “performance” in different ways: 1) how they were musically and dramatically performed in their original context in Antiquity (what were the rhythms, the harmonies, the dance-steps, the props used, etc.); 2) what the performance meant, in socio-cultural and political terms, for the people involved in performing or watching it, and how performance takes place beyond the stage; 3) how these texts are performed in modern times (what it means for us to translate and stage ancient plays with masks, a chorus, etc.; to reenact some ancient institutions; to reconstruct ancient instruments or compose “new ancient music”); 4) in what ways modern poems, plays, songs, ballets constitute forms of interpretation, appropriation, or contestation of ancient texts; 5) in what ways creative and embodied practice can be a form of scholarship. Besides reading ancient Greek and Latin texts in translation, students read and watch performances of modern works of reception: poems, drama, ballet, and instrumental music. A few sessions are devoted to practical activities (reenactment of a symposium, composition of ancient music, etc.). Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** HUMS 065a / EDST 065a, Education and the Life Worth Living** Staff

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 freshmen. Preregistration required; see under Freshman Seminar Program. HU

HUMS 114a / AFAM 114a / CLCV 114a / LITR 155a, Rhetoric, A User's Guide (from Ancient Greece to the American Present) Emily Greenwood Milne

This course explores the classical rhetorical tradition and the various ways in which it has been adapted in modern American rhetoric up to the present. We analyze rhetorical theory and practice in ancient Greece and Rome, using classical rhetoric as a lens through which to explore the craft of speech in American history, and vice versa. Students emerge from this course able to tell *aposiopesis* from *praeteritio*, but rather than dry lectures on the history of rhetoric, the approach in lectures and section discussions is comparative through and through, staging curious conversations between ancient and modern as we examine the paths of words through history. We consider what makes individual speeches noteworthy in their local, historical contexts, as well as within a wider rhetorical tradition, and we analyze the role of ideologies of gender, race, class, education, nationality, religion, and sexuality in the construction of the rhetorical subject. In addition, the classical rhetorical tradition of Greece and Rome is compared and contrasted with parallel traditions of classical rhetoric in ancient China and India. Due attention is paid to methodological problems in the history of rhetoric and debates in rhetorical theory. WR, HU

*** HUMS 127a or b / ENGL 129a or b / LITR 168a or b / THST 129a or b, Tragedy in the European Literary Tradition** Staff

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. WR, HU

*** HUMS 128a / NELC 128a, From Gilgamesh to Persepolis: Introduction to Near Eastern Literatures** Kathryn Slanski

This lecture 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. WR, HU

*** HUMS 130a / LITR 130a, How to Read** Rudiger Campe and Hannan Hever

Introduction to techniques, strategies, and practices of reading through study of lyric poems, narrative texts, plays and performances, films, new and old, from a range of times and places. Emphasis on practical strategies of discerning and making meaning,

as well as theories of literature, and contextualizing particular readings. Topics include form and genre, literary voice and the book as a material object, evaluating translations, and how literary strategies can be extended to read film, mass media, and popular culture. Junior seminar; preference given to juniors and majors. HU

HUMS 133a / JDST 110a / RLST 145a, The Bible Christine Hayes

The writings common to both Jewish and Christian scripture examined as diverse and often conflicting expressions of the religious life and thought of ancient Israel. The works' cultural and historical setting in the ancient Near East; the interpretive history of selected passages influential in Western culture. Introduction to a wide range of critical and literary approaches to biblical studies. Students view course lectures, which survey the entire Bible, on line; class time focuses on specific biblical passages and their subsequent interpretation in Jewish and Christian culture. HU

HUMS 134a / ENGL 154a / FREN 216a / LITR 194a, The Multicultural Middle Ages

Ardis Butterfield and Marcel Elias

Introduction to medieval English literature and culture in its European and Mediterranean context, before it became monolingual, canonical, or author-bound. Genres include travel writing, epic, dream visions, mysticism, the lyric, and autobiography, from the Crusades to the Hundred Years War, from the troubadours to Dante, from the *Chanson de Roland* to Chaucer. Formerly ENGL 189. WR, HU

HUMS 144a / CLCV 206a / HIST 217a, The Roman Republic Andrew Johnston

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

*** HUMS 179b / ENGL 337b, Shakespeare's Political Plays** David Bromwich

Reading and interpretation of selected histories and tragedies from *Richard II* to *The Tempest* with emphasis on the tension between individual freedom and political obligation. WR, HU

HUMS 180a / ITAL 310a / LITR 183a, Dante in Translation Christiana Purdy

Moudarres

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

*** HUMS 184a / AMST 184a / ENGL 437a, 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

* **HUMS 185a / ENGL 419a / HSAR 460a, 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. Formerly ENGL 247. WR, HU

* **HUMS 192a / HIST 299Ja, Intellectuals and Power in Europe** Terence Renaud

The role of intellectuals in politics, with a focus on social, cultural, and political upheavals in Europe during the nineteenth and twentieth centuries. Whether intellectuals betray a higher spiritual calling when they enter politics or merely strive to put their own theories into practice. Modern answers to the question of why ideas and intellectuals matter. HU

* **HUMS 200b / ENGL 205b / LITR 195b / MUSI 462b, 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 201b / FREN 240b / LITR 214b, The Modern French Novel Maurice Samuels and Alice Kaplan

A survey of major French novels, considering style and story, literary and intellectual movements, and historical contexts. Writers include Balzac, Flaubert, Proust, Camus, and Sartre. Readings in translation. One section conducted in French. HU TR

HUMS 206b / ENGL 191b / LITR 318b / MMES 215b / NELC 201b, The Arabian Nights, Then and Now Robyn Creswell

Exploration of *Arabian Nights*, a classic of world literature. Topics include antecedents, themes and later prose, and graphic and film adaptations. HU TR

* **HUMS 208a / ENGL 257a / GMAN 312a / LITR 485a, Poe and Kafka** Caleb Smith and Paul North

Some mysteries seem unresolvable by science or religion. For instance, there is the mystery of how people remain hidden from themselves#of repressed impulses and buried truths that find expression in fantasies, dreams, and other strange visions. A word for this mystery is the unconscious. Some terms for its literature include the gothic and the grotesque. Our experimental course pursues this mystery by studying two writers working in different languages, in different centuries, in a variety of minor, unprestigious genres: Edgar Allan Poe and Franz Kafka. We use tales and other short texts by each writer to illuminate the other's techniques for examining the psychological and political unconscious. WR, HU

* **HUMS 209b / ENGL 213b / LITR 487b, The Poetry of Wordsworth and Shelley** David Bromwich

An exploration of the major poems of William Wordsworth and Percy Shelley, with emphasis on the diverse imaginings required for lyrics and longer works such as *The Prelude* and *Prometheus Unbound*. WR, HU

* **HUMS 210b / ITAL 317b / LITR 180b / WGSS 317b, Women in the Middle Ages** Christiana Purdy Moudarres

Medieval understandings of womanhood examined through analysis of writings by and/or about women, from antiquity through the Middle Ages. Introduction to

the premodern Western canon and assessment of the role that women played in its construction. HU TR

HUMS 213b / ENGL 159b / LITR 339b / THST 262b, Global Shakespeares: Race, Gender, and the Idea of the Human Ayesha Ramachandran

Shakespeare today is a global phenomenon: over five hundred years after his death, the playwright's legacy continues to flourish with new performances, reworkings, appropriations, and adaptations continuously produced across the world in a range of languages and across various media. Once exported along with the ideologies and practices of empire, Shakespeare's works have now become an index for the complex histories of colonialism and postcolonialism as well as a crucial site for studying processes of racialization and the universalizing idea of "the human." How did Shakespeare become global? Was the cultural imagination of his plays always already global, written at a time with the very notion of the modern world as we know was being shaped? This course explores the political afterlives of "Shakespeare" as a cultural icon and aesthetic touchstone for the Western tradition through a close reading of four plays alongside their adaptations: *Hamlet*, *Othello*, *King Lear*, and *Antony and Cleopatra*. We look at films, novels, *manga* comics, memoirs, stand-up comic routines, along with classic stagings of the plays to elucidate the themes that have made Shakespeare global – in particular, questions of race, gender, sexuality, generational conflict, and political intrigue. Authors and directors include Akira Kurosawa, Vishal Bharadwaj, Janet Suzman, Iqbal Khan, James Baldwin, Sulayman Al-Bassam, Tayeb Salih, Preti Taneja, and Derek Walcott. This is the non-intensive writing version of LITR 340 and is worth 1 credit. It meets with LITR 340. Students may earn credit for LITR 339 (1 credit) or for LITR 340 (1.5 credits) but not for both. WR, HU

* **HUMS 215a / LITR 273a, The Poetry of Vision: East and West** Riley Soles
Samuel Johnson's Dictionary of 1755 provides four definitions of the word vision: (1) sight; the faculty of seeing, (2) the act of seeing, (3) a supernatural appearance; a spectre; a phantom, (4) a dream; something in a dream. A dream happens to a sleeping man, a vision may happen to a waking man. A dream is supposed natural, a vision miraculous; but they are confounded. This course explores poetry that deals with any or all of these definitions, across a wide range of cultural and historical contexts, from the visionary, astral journeys of ancient Chinese verse to the visionary, redemptive apocalypse of William Blake, from the fleeting beauty in Japanese haiku to the high Sublime of American shore odes, from the psychedelic sermons of Buddhist scripture to the dream images of Geoffrey Chaucer, from the divine, cosmic manifestation in the *Bhagavad Gita* to the non-linear, multilayered poetics of Stéphane Mallarmé, from the spiritual and erotic yearnings of Rumi to the romantic and poetic longings of Hart Crane. HU

* **HUMS 216a / AFAM 247a / PLSC 282a, Democracy and Race in America: Thinking with Tocqueville and Du Bois** Giulia Oskian

Racial and economic inequalities have remained unsolved problems in American democracy since independence. For this reason, both historian Eric Foner and poet Amanda Gorman recently claimed that American democracy is still unfinished. To what extent and in what ways could pre-civil war America be considered democratic? What challenges did the democratic project face in the aftermath of the civil war and slave emancipation? How do these challenges still influence the American political life? This seminar addresses these questions with the two classical texts that are rarely read

together: Alexis de Tocqueville's *Democracy in America* and W. E. B. Du Bois's *Black Reconstruction in America*. HU, SO

HUMS 219a / AMST 215a / HIST 485a / HSHM 217a, Biomedical Futures and Michael Crichton's Monsters Joanna Radin

What forms of life have been produced by modern science? The literal life-changing technologies that began to emerge after the Second World War also provoked new anxieties. They expressed themselves in the speculative fiction of Michael Crichton in terms of monsters: the virus in *The Andromeda Strain*, the androids in *Westworld*, the velociraptors of *Jurassic Park*, and even the patients maimed by gunshot wounds in *ER*. Crichton wrote thrilling stories that also asked his readers to consider what monsters humans could make if they didn't stop to consider whether or not they should. This course examines the emergence of modern life science to consider what it would take to produce more life-sustaining futures. HU, SO

*** HUMS 220a / HIST 289Ja / HSAR 399a / HSHM 407a, Collecting Nature** Paola Bertucci

A history of museums before the emergence of the modern museum. Focus on: cabinets of curiosities and Wunderkammern, anatomical theaters and apothecaries' shops, alchemical workshops and theaters of machines, collections of monsters, rarities, and exotic specimens. WR, HU TR

*** HUMS 224b / HIST 210Jb, 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

*** HUMS 228a / EVST 228a / HIST 459Ja / LITR 345a, 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 236a or b / GMAN 248a or b / LITR 240a or b / THST 248a, Goethe's Faust** Kirk Wetters and Jan Hagens

Goethe's *Faust*, with special attention to *Faust II* and to the genesis of *Faust* in its various versions throughout Goethe's lifetime. Emphasis on the work in context of Goethe's time and in the later reception and criticism. Reading knowledge of German beneficial but not required. HU TR

* **HUMS 241b / AFAM 182b / AMST 286b / ENGL 182b, James Baldwin's American Scene** Jacqueline Goldsby

In-depth examination of James Baldwin's canon, tracking his work as an American artist, citizen, and witness to United States society, politics, and culture during the Cold War, the Civil Rights era, and the Black Arts Movement. HU

* **HUMS 247b / SOCY 352b, Material Culture and Iconic Consciousness** Jeffrey Alexander

How and why contemporary societies continue to symbolize sacred and profane meanings, investing these meanings with materiality and shaping them aesthetically. Exploration of "iconic consciousness" in theoretical terms (philosophy, sociology, semiotics) and further exploration of compelling empirical studies about food and bodies, nature, fashion, celebrities, popular culture, art, architecture, branding, and politics. HU, SO

* **HUMS 248a, Monuments and Memorials: Shaping Historical Memories** Virginia Jewiss

Monuments, from the Latin *monere*, are intended to admonish and advise the viewer. Memorials—placeholders of memory—invite us to remember and reflect. Simultaneously commemorative and cautionary, monuments and memorials aim to speak both to their own moment and to posterity. Yet what they say changes, and the memories they honor are often contested, as recent controversies at Yale and beyond have underlined. Drawing on examples from antiquity to the present, from ancient Egypt to the Elm City, this interdisciplinary seminar explores monuments and memorials as political, cultural, social, and aesthetic expressions, and the ways they operate within and beyond the historical moment in which they were created. Physical manifestations of memory are considered together with literary and historical works that complement and challenge notions of permanence, perpetuity, and power of expression. Current debates about monuments are set alongside the practice of *damnatio memoriae* in ancient Rome; iconoclasm; and alternative or counter-monuments that subvert the traditional commemorative lexicon. Particular attention is given to monuments at Yale and the New Haven area, with on-site classes. HU

* **HUMS 252b / AMST 346b / ENGL 235b, Poetry and Objects** Karin Roffman

This course on 20th and 21st century poetry studies the non-symbolic use of familiar objects in poems. We meet alternating weeks in the Beinecke library archives and the Yale Art Gallery objects study classroom to discover literary, material, and biographical histories of poems and objects. Additionally, there are scheduled readings and discussions with contemporary poets. Assignments include both analytical essays and the creation of online exhibitions. WR, HU

* **HUMS 253a / ENGL 346a / RLST 233a, 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 264b / HIST 256Jb, Imagining the Body Politic: Constitutional Art and Theory from Antiquity to the Present** Staff

Do visual representations of social and political principles have a peculiar power to produce, reproduce, and disturb social and political relations? To what extent do some works of political theory seem to presuppose an imaginative construct, in particular

one based on human bodies and their parts? Can we identify the birth of the modern state through an examination of key images of the body politic? Have the machine or network or program taken over the function of the body metaphor in more recent times? Does visualizing the principles and orders of society and politics elicit new critical awareness and reaction, or blindness and obedience? Does republican art differ fundamentally in this regard from monarchical – or fascist or communist or anarchist or neoliberal – art? HU

HUMS 270a / CHNS 200a / EALL 200a / EAST 240a, The Chinese Tradition Tina Lu

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 TR

* **HUMS 286a / ER&M 279a / HIST 295Ja / PHIL 433a, Mass Incarceration in the Soviet Union and the United States** Timothy Snyder and Jason Stanley

The Franke Seminar. An investigation of the experience and purposes of mass incarceration in the Soviet Union and the United States in the twentieth century. Incarceration is central to the understanding, if not usually to the self-understanding, of a society. It is thus a crucial aperture into basic questions of values and practices. This course proposes a frontal approach to the subject, by investigating two of the major carceral systems of the twentieth century, the Soviet and the American. Intensive reading includes first-person accounts of the Gulag and American prison as well as scholarly monographs on the causes of mass incarceration in different contexts. Brief account is taken of important comparative cases, such as Nazi Germany and communist China. Guest lectures and guest appearances are an important element of our teaching. HU TR

* **HUMS 287b / GMAN 373b / HIST 455Jb / WGSS 347b, Resistance in Theory and Practice** Terence Renaud

Exploration of the histories and theories of resistance in the modern world. How liberation movements, guerrillas, and oppressed groups appeal to resistance as an organizational strategy and as moral justification. Readings include Kant, Thoreau, Nietzsche, Luxemburg, Lenin, Gandhi, Fanon, Arendt, Marcuse, Foucault, A. Lorde, Said, and J. Butler. Themes include antifascism to terrorism; violence to nonviolence, the New Left to Black Lives Matter. HU TR

* **HUMS 313b / HIST 212Jb, Philosophy of Dissent in Central and Eastern Europe** Marci Shore

This is a seminar in the field of European intellectual history, based on primary sources. It focuses on how philosophers, novelists, sociologists, and other thinkers developed and articulated a philosophy of dissent under communism. More specific topics include the relationships between temporality and subjectivity and between truth and lies, and the role that existentialism played in formulating philosophical critiques of repression. Readings consist of a mixture of philosophical and literary works from the Soviet Union, East Germany and the lands in-between. Potential authors include Merab Mamardashvili, Danilo Kiš, Józef Tischner, Adam Michnik, Jacek Kuro#, Ladislav

Hejdanek, Václav Havel, Jan Patočka, Leszek Kołakowski, Gajo Petrovič, Norman Manea, Lev Kopelev, Igor Pomerantsev, Tomas Venclova. HU

* **HUMS 323a / HIST 236Ja, 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, Žižek, and Xu Zhongrun. WR, HU

HUMS 339a / HIST 271a / RSEE 271a, European Intellectual History since Nietzsche

Marci Shore

Major currents in European intellectual history from the late nineteenth century through the twentieth. Topics include Marxism-Leninism, psychoanalysis, expressionism, structuralism, phenomenology, existentialism, antipolitics, and deconstruction. HU

* **HUMS 366a / FREN 330a, The World of Victor Hugo's "Les Misérables"** Maurice Samuels

Considered one of the greatest novels of all time, Victor Hugo's *Les Misérables* (1862) offers more than a thrilling story, unforgettable characters, and powerful writing. It offers a window into history. Working from a new translation, this seminar studies Hugo's epic masterpiece in all its unabridged glory, but also uses it as a lens to explore the world of nineteenth-century France—including issues such as the criminal justice system, religion, poverty, social welfare, war, prostitution, industrialization, and revolution. Students gain the tools to work both as close readers and as cultural historians in order to illuminate the ways in which Hugo's text intersects with its context. Attention is also paid to famous stage and screen adaptations of the novel: what do they get right and what do they get wrong? Taught in English, no knowledge of French is required. HU

* **HUMS 370a / AFAM 354a / ENGL 351a, Fictions of the Harlem Vogue: Novels, Short Stories, and Novellas of the “Harlem Renaissance”** Ernest Mitchell

In this seminar, we examine the major novels, short stories, and novellas of the Harlem Vogue (1923-1934), the first decade of the Negro Renaissance. Key texts by Jessie Fauset, Nella Larsen, Jean Toomer, and Eric Walrond are central, along with lesser-known works by Zora Neale Hurston and Langston Hughes. We consider critical debates about these texts and their standard designation as part of the “Harlem Renaissance.” Careful close reading is emphasized throughout; students are guided through a process of archival research and sustained formal analysis to produce a polished critical essay. WR, HU

* **HUMS 371b / ENGL 329b / HSAR 441b / LITR 402b, The Picturebook: Euro-American and Japanese Traditions** Katie Trumpener

Examines the form, history, and preoccupations of the picturebook form from the eighteenth century to the present, juxtaposing Euro-American with Japanese picturebook traditions. HU

* **HUMS 372a / GMAN 362a / LITR 489a, 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 TR

* **HUMS 374a / GMAN 307a / LITR 464a, Greed and Its Discontents: From Aristotle to the Present** Paul North

Money matters, whether we like it or not. Besides being an economic means, it plays a pervasive role in the lives of individuals and the social fabric at large—a role scrutinized by writers, philosophers, and cultural theorists. By opening up a vast horizon of possibilities, money represents power and desire. It is regarded as an enabler of freedom by some, and as a source of alienation by others. Money is said to be detrimental to social cooperation, as it fuels the “frenzy to achieve distinction” (Jean-Jacques Rousseau). When it comes to greed and its discontents, issues of status, recognition, and contempt come into play. Money, which has been called an “abstract” form of happiness (Arthur Schopenhauer), permeates the debates on the intricate relation between well-being, welfare, and wealth. On a macro level, the standings of different social spheres, including the economy, politics, and the realm of intimate relationships, depend on the question of whether “everything is for sale” or not (Debra Satz). In this course, we explore the meaning of money by tracing the arc from Aristotle to the present. HU

* **HUMS 380b / ENGL 395b / LITR 154b, 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 409a / FREN 403a / LITR 224a, Proust Interpretations: Reading Remembrance of Things Past** R Howard Bloch and Pierre Saint-Amand

A close reading (in English) of Marcel Proust’s masterpiece, *Remembrance of Things Past*, with emphasis upon major themes: time and memory, desire and jealousy, social life and artistic experience, sexual identity and personal authenticity, class and nation. Portions from *Swann’s Way*, *Within a Budding Grove*, *Cities of the Plain*, *Time Regained* considered from biographical, psychological/psychoanalytic, gender, sociological, historical, and philosophical perspectives. WR, HU

* **HUMS 411b, Life Worth Living** Staff

Comparative exploration of the shape of the life advocated by several of the world's normative traditions, both religious and nonreligious. Concrete instantiations of these traditions explored through contemporary exemplars drawn from outside the professional religious or philosophical spheres. Readings from the founding texts of Buddhism, Judaism, Christianity, Islam, Marxism, and utilitarianism. HU

* **HUMS 414a / GMAN 414a / LITR 262a, Georg Büchner's Revolutions** Rudiger Campe

Georg Büchner's (1813-1837) is a work across times and places. In *Danton's Death* he reenacts the French Revolution, in the pamphlet *Hessian Messenger* he calls for revolution in German lands. Büchner's other, simultaneous, revolution is one of language and literature. In the narrative *Lenz* and the theater play *Woyzeck*, Büchner turns the Romanticism of his own time upside down and the two works resurface only ca. 1900 as trail blazers of social naturalism and modernist (postdramatic) theater. Celan, in the *Meridian*, gives an idiosyncratic account of Büchner's travel across times and places. The course contextualizes the close reading of Büchner's work with materials from the French Revolution, early socialists, Marx; French, German, British Romanticism; prose and theater ca. 1900 when Büchner is rediscovered; Celan. HU
TR

* **HUMS 424b / CGSC 492 / PHIL 492, Metaphysics Meets Cognitive Science: Objects, Causation, Time, and Self** Laurie Paul and Brian Scholl

The premise (and promise) of cognitive science is that we will come to understand ourselves better by integrating the insights and contributions from multiple fields of inquiry. This interdisciplinary project has been especially vibrant when it has explored the intersection of philosophy and psychology (for example when work in ethics integrates empirical work from moral psychology, or when work in the philosophy of mind integrates neuroscientific studies of consciousness). But cognitive science has interacted far less with the study of *metaphysics* – the philosophical exploration of topics such as time, causation, and possibility. This may seem surprising, since there has been a great deal of fascinating empirical research on the mental representations and cognitive processes involved in such topics. Accordingly, this seminar attempts to bridge this gap, exploring potential interactions between these fields. In particular, we explore the possibility of a 'cognitive metaphysics', in which each field is enriched by consideration of the other. How might metaphysical theories raise questions or identify concepts of interest to working cognitive scientists? How might empirical studies from cognitive science on the nature of seeing and thinking contribute to the study of metaphysics? Specific topics likely include the ways in which we understand the nature (in both the mind and the world) of space, time, objects, events, causality, persistence, and possibility. (And along the way, we also consider some more particular topics, such as the asymmetry between past and future experience, the apparent backwards causation in the context of Newcomb's puzzle, and why the present seems special.) This course is the Shulman Seminar. A previous course other in either philosophy or psychology is presumed. HU, SO

* **HUMS 427b / ENGL 456b / JDST 316b / LITR 348b, The Practice of Literary Translation** Peter Cole

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. HU

* **HUMS 428a / ENGL 483a / JDST 343a / LITR 305a, Advanced Literary Translation**
Robyn Creswell

A sequel to LITR 348, *The Practice of Literary Translation*. Students apply to this workshop with a project in mind that they have been developing, either on their own or for a senior thesis, and they present this work during the class on a regular basis. Practical translation is supplemented by readings in the history of translation practice and theory, and by the reflections of practitioners on their art. These readings are selected jointly by the instructor and members of the class. Topics include the history of literary translation – Western and Eastern; comparative approaches to translating a single work; the political dimension of translation; and translation in the context of religion and theology. Class time is divided into student presentations of short passages of their own work, including related key readings; background readings in the history of the field; and close examination of relevant translations by accomplished translators. Students receive intensive scrutiny by the group and instructor. Prerequisite: LITR 348.

* **HUMS 430a / ENGL 248a / HSHM 476a / LITR 483a / PHIL 361a, Thought Experiments: Connecting Literature, Philosophy and the Natural Sciences** Paul Grimstad

The course looks closely at the intersection of literature, philosophy and natural science through the lens of the thought experiment. Do thought experiments yield new knowledge about the world? What role does narrative or scene setting play in thought experiments? Can works of literary fiction or films function as thought experiments? Readings take up topics such as personal identity, artificial intelligence, meaning and intentionality, free will, time travel, the riddle of induction, “trolley problems” in ethics and the hard problem of consciousness. Authors may include Mary Shelley, Plato, Albert Einstein, Franz Kafka, H.G. Wells, Rene Descartes, Kazuo Ishiguro, Rivka Galchen, Alan Turing, Hilary Putnam, as well as films (*The Imitation Game*) and television shows (*Black Mirror*). Students should have taken at least one course involving close analysis of works of literature or philosophy. WR, HU

* **HUMS 444a / ITAL 332a, The City of Rome** Virginia Jewiss

An interdisciplinary study of Rome from its legendary origins through its evolving presence at the crossroads of Europe and the world. Significant moments of Roman and world history will be considered through the literature, intellectual history, political science, theology, and arts inspired by Rome. HU

* **HUMS 480a / GMAN 288a / LITR 482a / PHIL 469a, The Mortality of the Soul: From Aristotle to Heidegger** Martin Hagglund

This course explores fundamental philosophical questions of the relation between matter and form, life and spirit, necessity and freedom, by proceeding from Aristotle's

analysis of the soul in *De Anima* and his notion of practical agency in the *Nicomachean Ethics*. We study Aristotle in conjunction with seminal works by contemporary neo-Aristotelian philosophers (Korsgaard, Nussbaum, Brague, and McDowell). We in turn pursue the implications of Aristotle's notion of life by engaging with contemporary philosophical discussions of death that take their point of departure in Epicurus (Nagel, Williams, Scheffler). We conclude by analyzing Heidegger's notion of constitutive mortality, in order to make explicit what is implicit in the form of the soul in Aristotle.

HU

* **HUMS 491a, 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 by November 16, 2021, if the essay is to be submitted during the spring term. The final essay is due at noon on April 8, 2022 for spring-term essays. For essays to be completed in the fall term, a rough draft is due October 25, 2021, and the final essay due November 29, 2021. RP

Hungarian (HGRN)

Indonesian (INDN)

INDN 110a, 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 120b, 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 130a, 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 140b, Intermediate Indonesian II** Dinny Aletheiani

Continuation of INDN 130. After INDN 130 or equivalent. Limited enrollment. L4 1½ Course cr

* **INDN 150a, Advanced Indonesian I** Dinny Aletheiani

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 180b, 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.

* **INDN 470a and INDN 471b, 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 110a, 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 120b, Elementary Italian II** Staff

Continuation of ITAL 110. L2 1½ Course cr

* **ITAL 125b, Intensive Elementary Italian** Staff

An accelerated beginning course in Italian that covers in one term the material taught in ITAL 110 and 120. Admits to ITAL 130 or 145. Enrollment limited to 15. L1, L2 2 Course cr

* **ITAL 130a, 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 140b, Intermediate Italian II** Staff

Continuation of ITAL 130. Emphasis on advanced discussion of Italian culture through authentic readings (short stories, poetry, and comic theater) and contemporary films. Admits to Group B courses. Conducted in Italian. L4 1½ Course cr

ITAL 150a, Advanced Composition and Conversation: Simona Lorenzini

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 151b, Advanced Italian Workshop** Staff

Our journey begins in the early 90s, in the wake of the fall of the "First Republic" (1948-1993), by contextualizing the socio-political situation of Italy at this important historical juncture. We then proceed to reading avant-garde and experimental poetry from the edgy "Gruppo '93" and move forward until today, listening and deciphering hip-hop artists such as Ghali and Bello FiGo, and exploring questions of appropriation, linguistics, identity, and more. By the end of this class, you will have read, analyzed, and translated several poems from contemporary Italy. Moreover, by being exposed to translation theory and critical analysis, you will also have developed your own philosophy of translation as well as critical skills related to

language use in both English and Italian. Furthermore, you will have acquired a deeper and better understanding of the last 30 years of Italian history. L5

* **ITAL 157a, 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* and the films *Storia di ragazzi e ragazze*, *Caro diario*, and *La stanza del figlio*. L5, HU

* **ITAL 162a, 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 172b, Introduction to Italian Literature: From the Baroque to the Present**
Simona Lorenzini

This course is the second course in a sequence studying Italian Literature. This course introduces students to the masterpieces of Italian literature, in prose and poetry, from the Baroque to the 21st century. We closely read sample writings representative of the most important authors and literary movements, including Galileo, Manzoni, Pirandello, and Ferrante, and the ways in which they encompassed science, medicine, culture, law, gender. Through critical readings, textual analysis, and class discussions, students appreciate the intellectual and artistic traditions that shaped the birth of the Italian nation. Texts and authors are examined in their historical, social, and cultural context. The course is conducted in Italian. Students are required to take notes during the lectures and learn new vocabulary specific to the topic studied. Prerequisite: ITAL 140 or equivalent. L5, HU

* **ITAL 303b / FILM 457b / LITR 359b, Italian Film from Postwar to Postmodern**
Millicent Marcus

A study of important Italian films from World War II to the present. Consideration of works that typify major directors and trends. Topics include neorealism, self-reflexivity and metacinema, fascism and war, and postmodernism. Films by Fellini, Antonioni, Rossellini, De Sica, Visconti, Pasolini, Bertolucci, Wertmuller, Tornatore, and Moretti. Films in Italian with English subtitles. WR, HU

* **ITAL 306a / FILM 366a, Spotlight on Sicily in Literature and Film** Millicent Marcus

Sicily has always occupied a privileged place in the Italian imagination. The course focuses on a series of fictional works and films#from the early 20th century until today#which reveal how this island has served as a vital space for cinematic

experimentation and artistic self-discovery. Topics range from unification history, the Mafia, the migrant crisis, environmental issues, gender, and social/sexual mores. The course is taught in English, but those who wish to enroll for credit towards the certificate in Italian, or the major, can make arrangements to do so. WR, HU

ITAL 310a / HUMS 180a / LITR 183a, Dante in Translation Christiana Purdy Moudarres

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 TR

ITAL 315a / HIST 280a / RLST 160a, 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

* **ITAL 317b / HUMS 210b / LITR 180b / WGSS 317b, Women in the Middle Ages** Christiana Purdy Moudarres

Medieval understandings of womanhood examined through analysis of writings by and/or about women, from antiquity through the Middle Ages. Introduction to the premodern Western canon and assessment of the role that women played in its construction. HU

* **ITAL 332a / HUMS 444a, The City of Rome** Virginia Jewiss

An interdisciplinary study of Rome from its legendary origins through its evolving presence at the crossroads of Europe and the world. Significant moments of Roman and world history will be considered through the literature, intellectual history, political science, theology, and arts inspired by Rome. HU

* **ITAL 470a and ITAL 471a, Special Studies in Italian Literature** Simona Lorenzini

A series of tutorials to direct students in special interests and requirements. Students meet regularly with a faculty member.

* **ITAL 491a, The Senior Essay** Simona Lorenzini

A research essay on a subject selected by the student in consultation with the faculty adviser.

Japanese (JAPN)

* **JAPN 110a, Elementary Japanese I** Staff

Introductory language course for students with no previous background in Japanese. Development of proficiency in listening, speaking, reading, and writing, including 50 hiragana, 50 katakana, and 85 kanji characters. Introduction to cultural aspects such as levels of politeness and group concepts. In-class drills in pronunciation and conversation. Individual tutorial sessions improve conversational skills. L1 RP

1½ Course cr

*** JAPN 120b, Elementary Japanese II** Staff

Continuation of JAPN 110, with additional materials such as excerpts from television shows, anime, and songs. Introduction of 150 additional kanji. After JAPN 110 or equivalent. L2 RP 1½ Course cr

*** JAPN 130a, Intermediate Japanese I** Kumiko Nakamura

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 140b, Intermediate Japanese II** Mika Yamaguchi

Continuation of JAPN 130. After JAPN 130 or equivalent. L4 RP 1½ Course cr

*** JAPN 150a, Advanced Japanese I** Mari Stever

Advanced language course that further develops proficiency in reading, writing, speaking, and listening. Reading and discussion materials include works by Nobel Prize winners. Japanese anime and television dramas are used to enhance listening and to develop skills in culturally appropriate speech. Writing of essays, letters, and criticism solidifies grammar and style. Individual tutorial sessions improve conversational skills. After JAPN 140 or equivalent. L5 RP

*** JAPN 151b, Advanced Japanese II** Hiroyo Nishimura

Continuation of JAPN 150. After JAPN 150 or equivalent. L5 RP

*** JAPN 156a, Advanced Japanese III** Mika Yamaguchi

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 157b, Advanced Japanese IV** Kumiko Nakamura

Continuation of JAPN 156. After JAPN 156 or equivalent. L5

JAPN 170a and JAPN 570a, Introduction to Literary Japanese Edward Kamens

Introduction to the grammar and style of the premodern literary language (*bungotai*) through a variety of texts. After JAPN 151 or equivalent. L5

Judaic Studies (JDST)

JDST 110a / HUMS 133a / RLST 145a, The Bible Christine Hayes

The writings common to both Jewish and Christian scripture examined as diverse and often conflicting expressions of the religious life and thought of ancient Israel. The works' cultural and historical setting in the ancient Near East; the interpretive history of selected passages influential in Western culture. Introduction to a wide range of critical and literary approaches to biblical studies. Students view course lectures, which survey the entire Bible, on line; class time focuses on specific biblical passages and their subsequent interpretation in Jewish and Christian culture. HU

JDST 200a / ER&M 219a / HIST 219a / MMES 149a / RLST 148a, Jewish History and Thought to 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

* **JDST 213a / HEBR 150a / MMES 150a, Advanced Modern Hebrew: Daily Life in Israel** Orit Yeret

An examination of major controversies in Israeli society. Readings include newspaper editorials and academic articles as well as documentary and historical material. Advanced grammatical structures are introduced and practiced. Conducted in Hebrew. Prerequisite: HEBR 140 or equivalent. L5 RP

* **JDST 217a / GMAN 382a / PHIL 424a, Hegel's Phenomenology of Spirit** Paul Franks and Hugo Havranek

A close reading of sections of one of the major works in post-Kantian philosophy. Themes include varieties of scepticism and responses to scepticism; the relationship of epistemology to questions concerning structures of social practices of reasoning; the historical character of reason; the relationship between natural processes and social developments; the intersubjectivity of consciousness; and the possibility of a philosophical critique of culture. Attention paid both to commentaries that focus on historical development and to approaches that view historical narratives as allegories whose deeper meaning may be formulated as a logical or semantic theory. Two previous philosophy courses, including some exposure to Kant and German Idealism, through either DRST 004 or PHIL 126 or PHIL 214 or PHIL 261. Students are particularly encouraged but not required to take PHIL 261 before taking this course. HU

* **JDST 293a / HIST 248Ja / RLST 214a, Introduction to Modern Jewish Thought** Elli Stern

An overview of Jewish philosophical trends, movements, and thinkers from the seventeenth century to the twenty-first. Topics include enlightenment, historicism, socialism, secularism, religious radicalism, and Zionism. HU

* **JDST 297b / RLST 192b, Religion, Ethnicity, and Identity in American Jewish History** Elli Stern

An exploration of how Jews in America negotiated, and renegotiated, religion and ethnicity to forge a hyphenated American identity. Topics include the impact of Protestant domination, immigrant experiences and legacies, the role of discrimination, and self-presentation and representation by others. Each term prospective junior History majors should apply for seminars for the following term using the online junior seminar preregistration site. Preregistration begins after midterm in the fall for seminars offered in the spring term, and after spring recess for seminars offered in the subsequent fall term. In September and in January, application for admission should be made directly to the instructors of the seminars, who will admit students to remaining vacancies in their seminars. Priority is given to applications from juniors, then seniors, majoring in History, but applications are also accepted from qualified sophomores and from students majoring in other disciplines or programs. HU

* **JDST 300b / HIST 267Jb, The Holocaust in Contemporary Culture and Politics** Elli Stern

This course examines public debates and controversies over the appropriate response to the Holocaust over the past half century. We begin by looking at the context of the beginnings of Holocaust consciousness, paying special attention to the trial of Adolf Eichmann, the Six Day War in Israel, and the Civil Rights Movement. We explore the works of popular authors who attempted to draw particular or universal lessons from the history of the Holocaust, such as Hannah Arendt and Emil Fackenheim, as well as major representations of the Holocaust on TV and film, such as the NBC miniseries “Holocaust” and Claude Lanzmann’s documentary “Shoah.” We then move to a study of the controversies surrounding Holocaust education, including debates around the Holocaust museum in Washington, DC, the memorial to murdered Jews in Berlin, and Jewish tourist sites in post-communist Eastern Europe. The final part of the seminar is dedicated to the most recent scholarly arguments about the “uniqueness” of the Holocaust, the relationship of the Holocaust to other genocides and of Jews to other victims, and the parallels between contemporary and historic antisemitism. HU

* **JDST 316b / ENGL 456b / HUMS 427b / LITR 348b, The Practice of Literary Translation** Peter Cole

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. HU

* **JDST 319a / HEBR 162a / MMES 161a, Israel in Ideology and Practice** Dina Roginsky

An advanced Hebrew class focusing on changing ideology and politics in Israel. Topics include right and left wing political discourse, elections, State-Religion dynamics, the Jewish-Arab divide, and demographic changes. Materials include newspapers, publications, on-line resources, speeches of different political and religious groups, and contemporary and archival footage. Comparisons to American political and ideological discourse. Prerequisite: HEBR 140 or permission of instructor. L5 RP

* **JDST 329b / LITR 235b, Modern Jewish Poets** Peter Cole

This course introduces students to a diverse group of modern Jewish poets—from Gertrude Stein, Moyshe Leyb-Halpern, and Adrienne Rich to Muriel Rukeyser, Yehuda Amichai, Paul Celan, Edmond Jabès, Leonard Cohen, and others. Writing in English, Yiddish, German, Hebrew, and French, these poets gave seminal expression to Jewish life in a variety of modes and permutations, and in the process produced poems of lasting and universal value. The class explores work as art and considers pressing questions of cultural, historical, and political context. All readings are in English. HU

JDST 340a / HIST 252a, Political History of European Jewry, 1589–1897 David Sorkin

The reshaping of political principles that governed Jewish life in the European diaspora during the modern period. The Jews' internal traditions of political self-understanding and behavior; the changing political status of Jews in Europe; Jewish political participation in European society. HU

*** JDST 343a / ENGL 483a / HUMS 428a / LITR 305a, Advanced Literary Translation** Robyn Creswell

A sequel to LITR 348, *The Practice of Literary Translation*. Students apply to this workshop with a project in mind that they have been developing, either on their own or for a senior thesis, and they present this work during the class on a regular basis. Practical translation is supplemented by readings in the history of translation practice and theory, and by the reflections of practitioners on their art. These readings are selected jointly by the instructor and members of the class. Topics include the history of literary translation – Western and Eastern; comparative approaches to translating a single work; the political dimension of translation; and translation in the context of religion and theology. Class time is divided into student presentations of short passages of their own work, including related key readings; background readings in the history of the field; and close examination of relevant translations by accomplished translators. Students receive intensive scrutiny by the group and instructor. Prerequisite: LITR 348.

*** JDST 351a / HIST 268Ja / PLSC 466a / RLST 324a, 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 360b / HEBR 160b / MMES 155b, Hebrew in a Changing World** Dina Roginsky

Focus on how Hebrew language is used in Israel for constructing social norms, expectations, and day-to-day experiences. Topics include gendered language, political and PC language, military language, slang, humor, dialects, accents, name-giving practices, language in a sacred and in a secular context, and Americanization of the Hebrew language. Materials include advertisements, internet forums, movie clips, skits, maps, political stickers, and newspapers. Prerequisite: HEBR 140 or permission of instructor. LS

*** JDST 370a / HIST 226Ja / RLST 231a, Jews and Christians in the Formation of Europe, 500-1500** Ivan Marcus

This seminar studies topics related to the interactions between medieval Jewish communities and Christian leaders and social groups. Political, social, economic,

religious, and material features of medieval Jewish-Christian encounters are discussed.
WR, HU RP

*** JDST 400b / RLST 408b, Interpreting the Bible in Antiquity: Case Studies**

Christine Hayes

Examines the rich and polyphonic tradition of interpretation of two biblical narratives that were classical loci of Jewish-Christian polemic. Beginning with inner-bible exegesis, and continuing with ancient translations, Second Temple and Hellenistic period literature, early Christian sources, and finally classical rabbinic texts, this course explores the interpretative techniques and rhetorical strategies of ancient readers (especially *midrash* and allegory) and considers the way sacred texts have been employed to stake out competing intellectual and cultural claims. Prerequisite: reading proficiency in Hebrew. HU

*** JDST 409b / HEBR 159b / MMES 159b, 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 140 or permission of instructor. L5 RP

*** JDST 417b / HEBR 164b / MMES 167b, 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

*** JDST 421a / HEBR 170a / MMES 365a, Contemporary Israeli Art (1948 until today)**

Orit Yeret

An advanced level Modern Hebrew course which focuses on contemporary Israeli art, from 1948 until today. The course aims to expand student's knowledge of the Hebrew language and refine their writing, reading, speaking, and listening skills through the exposure to authentic materials in the field of the visual arts. Students engage with diverse Israeli visual art productions – such as: paintings, drawings, sculpture, photography, new media etc. – and employ critical thinking to discuss and analyze a variety of art pieces. Prerequisite: Completion of L4 (Modern Hebrew) or a placement exam. L5 RP

JDST 695b / HEBR 563b, From Biblical to Modern Hebrew Dina Roginsky

This course aims to support students who have reading knowledge of Biblical Hebrew but cannot read or converse in Modern Hebrew. The course concentrates on reading and aims at enabling students to use Modern Hebrew for research purposes. The texts chosen are tailored to students' particular areas of interest. Prerequisite: two years of Biblical or Modern Hebrew studies, or permission of the instructor. Conducted in English.

JDST 761a / HIST 596a / MDVL 596a / RLST 773a, Jewish History and Thought to 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.

JDST 806a / HIST 603a / MDVL 603a / RLST 616a, Jews and Christians in the Formation of Europe, 500–1500 Ivan Marcus

This seminar explores how medieval Jews and Christians interacted as religious societies between 500 and 1500.

JDST 835a / HEBR 519a, Israel in Ideology and Practice Dina Roginsky

An advanced Hebrew class that focuses on changing ideology and politics in Israel. Topics include right- and left-wing political discourse, elections, state-religion dynamics, the Jewish-Arab divide, and demographic changes. Materials include newspapers, publications, online resources, speeches of different political and religious groups, and contemporary and archival footage. Also, this course draws comparisons to American political and ideological discourse. Prerequisite: HEBR 502 or equivalent.

JDST 846a / HIST 598a / RLST 771a, Jewish Emancipation in the Nineteenth Century David Sorokin

A study of the various forms of emancipation politics in the nineteenth century. Conventional historiography has identified Haskalah (Jewish Enlightenment) and religious reform as the predominant forms of emancipation politics. This course explores neglected forms of emancipation politics including: the citizen intercessor, lawyers using law, organized community politics, cooperation with the state, opposition to the state, horizontal alliances, public protests, private diplomacy, etc.

JDST 857a / CPLT 924a, Modernism and Avant-Garde in Hebrew Poetry: Poetics and Theory Hannan Hever

Modernism in Hebrew poetry: close readings of the poetry of Nathan Alterman, Lea Goldberg, Nathan Zach, Yona Volakh, Avot Yeshurun. Prerequisites: a high level of reading Hebrew texts in poetry and criticism, and permission of the instructor.

Khmer (KHMR)

* **KHMR 110a, 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 minjin.hashbat@yale.edu for more information. L1
1½ Course cr

* **KHMR 120b, 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 minjin.hashbat@yale.edu for more information. L2 1½ Course cr

KHMR 130a, 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 minjin.hashbat@yale.edu for more information. Prerequisite: KHMR 120 or equivalent. L3 RP 1½ Course cr

KHMR 140b, 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 minjin.hashbat@yale.edu for more information. Prerequisite: KHMR 130 or equivalent. L4 RP 1½ Course cr

Kiswahili (SWAH)

SWAH 110a, 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 120b, Beginning Kiswahili II John Wa'Njogu

Continuation of SWAH 110. Texts provide an introduction to the basic structure of Kiswahili and to the culture of the speakers of the language. Prerequisite: SWAH 110. L2 1½ Course cr

SWAH 130a, 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 140b, Intermediate Kiswahili II Veronica Waweru

Continuation of SWAH 130. After SWAH 130. L4 1½ Course cr

SWAH 150a, 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 160b, Advanced Kiswahili II John Wa'Njogu

Continuation of SWAH 150. After SWAH 150. L5

SWAH 170a, 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 S110a, Elementary Korean I Staff

A beginning course in modern Korean. Pronunciation, lectures on grammar, conversation practice, and introduction to the writing system (*Hankul*). 1 1/2 Credit. Tuition \$4,200. Session B: July 1 - August 2. L1 1½ Course cr

* **KREN 110a, 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 120b, Elementary Korean II** Staff

Continuation of KREN 110. After KREN 110 or equivalent. L2 RP 1½ Course cr

* **KREN 130a or b, 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 RP 1½ Course cr

* **KREN 132a, 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 RP 1½ Course cr

* **KREN 140b, Intermediate Korean II** Hyunsung Lim

Continuation of KREN 130. After KREN 130 or equivalent. L4 RP 1½ Course cr

* **KREN 142b, Intermediate Korean for Advanced Learners II** Staff

Continuation of KREN 132. After KREN 132 or equivalent. L4 RP 1½ Course cr

KREN 150a, 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. Intended for nonheritage speakers. After KREN 140 or equivalent. L5

KREN 151b, Advanced Korean II: Language and Culture through Media Staff

This course is content and project-based to further develop integrated language skills-spoken and written, including grammar and vocabulary, as well as intercultural competence through Korean media. Through a variety of media, such as print media, publishing, digital media, cinema, broadcasting (radio, television, podcasting), and advertising, students explore and reflect on a wide range of topics and perspectives in Korean culture and society. The course learning activities include interactive, interpretive, and presentational communication; critical analysis; creative and authentic language applications in formal/informal contexts. After KREN 150 or equivalent. L5

* **KREN 152a or b, Advanced Korean for Advanced Learners** Staff

An advanced course in modern Korean. Reading of short stories, essays, and journal articles, and introduction of 200 Chinese characters. Students develop their speaking and writing skills through discussions and written exercises. After KREN 142 or 151, or with permission of instructor. L5

* **KREN 154b, Advanced Korean III** Seungja Choi

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 110a, 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 120. No prior knowledge of Latin assumed. Preregistration, which is required, takes place at the Academic Fair. See the *Calendar for the Opening Days* or the departmental Web site for details about preregistration. L1 RP 1½ Course cr

LATN 120b, Beginning Latin: Review of Grammar and Selected Readings Staff

Continuation of LATN 110. Emphasis on consolidating grammar and on readings from Latin authors. The sequence LATN 110, 120 prepares for 131 or 141. Prerequisite: LATN 110 or equivalent. L2 RP 1½ Course cr

LATN 131a, 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 141 or equivalent. L3

LATN 141b, 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 131 or equivalent. L3

* **LATN 390b, Latin Syntax and Stylistics** Joseph Solodow

A systematic review of syntax and an introduction to Latin style. Selections from Latin prose authors are read and analyzed, and students compose short pieces of Latin prose. For students with some experience reading Latin literature who desire a better foundation in forms, syntax, idiom, and style. L5, HU

* **LATN 413a, Rome's Africa, Africa's Rome** Raymond Lahiri

This class is an experiment in literary history. Covering more than seven hundred years, this course surveys the history of Latin literature by focusing on literary production from and about North Africa. Together, we explore two overarching questions: "What is the place of Roman Africa, former territory of the Carthaginian enemy, in the Roman literary imagination?" and "What is the place of Rome in the Roman North African literary imagination?" In doing so, we navigate the terrain of Roman and Latin literature from its beginnings through Late Antiquity, examining how Romans "wrote" into being the province of Africa and how writers from Roman North Africa "wrote back." Authors explored in this course (in Latin): Plautus, Sallust, Silius Italicus, Apuleius, Augustine, and Corippus. Authors explored in translation include: Livy, Vergil, Lucan, Tertullian, Lactantius, and Claudian. Prerequisite: LATN 141 (L4) or equivalent. L5, HU

* **LATN 450a, Roman Dining** Joseph Solodow

A course designed to bridge the gap between advanced high school Latin, or Latin at the L4 level, and Latin at the L5 level. Readings in Latin, with secondary readings

in English, on the topic of food, drink, and the protocols of dining in ancient Rome.

Prerequisite: L4 Latin course or advanced high school Latin. L5

LATN 465a and LATN 765a, Lucan Christina Kraus

Reading of selected Latin passages from Lucan's epic poem *The Civil War* (the whole poem to be read in English translation). Lucan's manipulation of the epic tradition; the lure and nature of violence in civil war narrative. L5, HU

Latin American Studies (LAST)

LAST 120b / LAST 244b / SPAN 244b, Writing in Spanish Margherita Tortora

Intensive instruction and practice in writing as a means of developing critical thinking. Recommended for students considering courses in literature. Analysis of fiction and nonfiction forms, techniques, and styles. Classes conducted in a workshop format. Group B courses are open to all students who have placed into L5 courses or who have successfully completed an L4 course in Spanish. Unless otherwise noted, all courses in group B are conducted in Spanish. L5

LAST 214a / AFAM 186a / PLSC 378a / SOCY 170a, Contesting Injustice Elisabeth Wood

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 freshmen and sophomores. SO

* **LAST 222a / SPAN 222a, 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 223a or b / SPAN 223a or b, Spanish in Film: An Introduction to the New Latin American Cinema** Margherita Tortora

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 225b / SPAN 225b, Spanish for the Medical Professions** Mercedes Carreras

Topics in health and welfare. Conversation, reading, and writing about medical issues for advanced Spanish-language students, including those considering careers in medical professions. Enrollment limited to 18. L5

* **LAST 227a / SPAN 227a, Creative Writing** Maria Jordan

An introduction to the craft and practice of creative writing (fiction, poetry, and essays). Focus on the development of writing skills and awareness of a variety of genres and techniques through reading of exemplary works and critical assessment of student work. Emphasis on the ability to write about abstract ideas, sentiments, dreams, and the imaginary world. 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 243a / SPAN 243a, Advanced Spanish Grammar** Terry Seymour

A comprehensive, in-depth study of grammar intended to improve students' spoken and written command of Spanish. Linguistic analysis of literary selections; some English-to-Spanish translation. Enrollment limited to 18. L5

LAST 244b / LAST 120b / SPAN 244b, Writing in Spanish Margherita Tortora
Intensive instruction and practice in writing as a means of developing critical thinking. Recommended for students considering courses in literature. Analysis of fiction and nonfiction forms, techniques, and styles. Classes conducted in a workshop format. L5

LAST 247a / SPAN 247a, Introduction to the Cultures of Latin America Staff
A chronological study of Latin American cultures through their expressions in literature and the arts, beginning in the pre-Columbian period and focusing on the period from the nineteenth century to the present. Emphasis on crucial historical moments and on distinctive rituals such as fiestas. 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 255b / ANTH 255b / ARCG 255b, Inca Culture and Society** Richard Burger
The history and organization of the Inca empire and its impact on the nations and cultures it conquered. The role of archaeology in understanding the transformation of Andean lifeways; the interplay between ethnohistoric and archaeological approaches to the subject. SO

LAST 261a / SPAN 261a, Studies in Spanish Literature I Jesus Velasco
An introduction to Spanish prose, drama, and lyric poetry from their medieval multicultural origins through the Golden Age in the seventeenth century. Readings include *El Cid*, *La Celestina*, *Conde Lucanor*, and works by Miguel de Cervantes and Calderón de la Barca. 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 262b / SPAN 262b, Studies in Spanish Literature II** Jesus Velasco
An introduction to Spanish prose, drama, and lyric poetry from the eighteenth century to the present, centered on the conflict between modernity and tradition and on the quest for national identity. Texts by Gustavo Adolfo Bécquer, Emilia Pardo Bazán, Antonio Machado, Federico García Lorca, Ramón Sender, and Ana María Matute, among others. Open to students who have placed into L5 courses or who have successfully completed an L4 course in Spanish. L5, HU

* **LAST 293b / ER&M 293b, History and Culture of Cuba** Albert Laguna
Investigation of the history and culture of Cuba from the colonial period to the present. Cultural production in the form of film, literature, and music discussed in relation to aesthetics and historical context. The course also engages with the history and culture of Cuban communities in the United States. HU

LAST 318b / ARCH 341b / GLBL 253b / URBN 341b, Globalization Space Keller
Easterling

Infrastructure space as a primary medium of change in global polity. Networks of trade, energy, communication, transportation, spatial products, finance, management, and labor, as well as new strains of political opportunity that reside within their spatial disposition. Case studies include free zones and automated ports around the world, satellite urbanism in South Asia, high-speed rail in Japan and the Middle East, agripoles

in southern Spain, fiber optic submarine cable in East Africa, spatial products of tourism in North Korea, and management platforms of the International Organization for Standardization. HU

LAST 355a / HIST 355a, Colonial Latin America Stuart Schwartz

A survey of the conquest and colonization of Latin America from pre-Columbian civilizations through the movements for independence. Emphasis on social and economic themes and the formation of identities in the context of multiracial societies.

HU

*** LAST 358a / SPAN 358a, Contemporary Spanish Caribbean Literature** Anibal González-Pérez

Introduction to contemporary literature from Cuba, Dominican Republic, and Puerto Rico, through prose and poetry works by representative authors: Nicolás Guillén, Alejo Carpentier, José Lezama Lima, Antonio José Ponte, Ena Lucía Portela, Juan Bosch, José Alcántara Almánzar, Rita Indiana, Luis Palés Matos, Luis Rafael Sánchez, Mayra Santos-Febres, Luis Negrón. Topics include colonialism and postcoloniality; race, gender, and nation; Cuba's Special Period; and the Puerto Rican debt crisis. Prerequisites: SPAN 140, 142, 145, or equivalent. L5, HU

*** LAST 360a / FILM 363a / LITR 360a, Radical Cinemas of Latin America** Moira Fradinger

Introduction to Latin American cinema, with an emphasis on post-World War II films produced in Cuba, Argentina, Brazil, and Mexico. Examination of each film in its historical and aesthetic aspects, and in light of questions concerning national cinema and "third cinema." Examples from both pre-1945 and contemporary films. Conducted in English; knowledge of Spanish and Portuguese helpful but not required. HU

*** LAST 369b / FILM 349b / HMRT 369 / LITR 369b, Gender Politics in Latin American Cinema** Moira Fradinger

Introduction to the contemporary politics of gender in Latin American cinema, with review of films from Argentina, Brazil, Colombia, Chile, Peru, Paraguay, Guatemala, Cuba, Venezuela and Mexico, and emphasis on how gender has been represented in a region with massive gender debates developing from the 1980s onwards. Topics include: discourses of human rights; representations of gay, transgender and intersex questions; social and economic status of women and feminized bodies; migration and indigenous peoples. Seminar is conducted in Spanish. Prerequisite: Level of L4. L5, HU

*** LAST 371a / SPAN 371a, Science and Fiction in Spanish American Narrative** Anibal González-Pérez

A study of the speculative incorporation of scientific ideas and themes in contemporary Spanish American fiction from Argentina, Chile, Cuba, Dominican Republic, Ecuador, and Peru. Readings and discussions of early and mid-20th-century precursors, such as Jorge Luis Borges, Adolfo Bioy Casares, Leopoldo Lugones, Pablo Palacio, and Clemente Palma; of late-20th to early 21st-century examples of "technowriting" in Samantha Schweblin, Jorge Volpi, and Alejandro Zambra, and of utopias, dystopias and possible futures in Jorge Adolph, Jorge Baradit, Hugo Correa, Angélica Gorodischer, Francisco Ortega, Yoss, Yuri Herrera, and Carlos Yushimito. Related themes include: post-humanism, ecofiction, and sociopolitical satire. Course is taught in Spanish. Prerequisite: L4 Spanish or higher. L5, HU

* **LAST 374a / ANTH 374a / ARCG 374a, Origins of Andean Civilization** Richard Burger

The diversity of early Andean complex societies and their transformations during the first two millennia B.C. Special attention to the Chavin civilization of the northern Peruvian highlands, including its art, technology, socioeconomic organization, territorial expansion, and cultural antecedents. Emphasis on recent research and on explanatory models that have been used to explain the emergence of complexity in pre-Hispanic Peru. SO RP

* **LAST 386a / GLBL 215a / MGRK 237a / PLSC 375a / SOCY 389a, Populism** Paris Aslanidis

Investigation of the populist phenomenon in party systems and the social movement arena. Conceptual, historical, and methodological analyses are supported by comparative assessments of various empirical instances in the US and around the world, from populist politicians such as Donald Trump and Bernie Sanders, to populist social movements such as the Tea Party and Occupy Wall Street. SO

* **LAST 392b / LITR 296b / PORT 392b, Brazil's Cannibal Modernism: From Modern Art Week to Antropofagia** Kenneth David Jackson

A study of Brazilian modernism in literature and the arts, centered on São Paulo's "Modern Art Week" of 1922 and the "Cannibal Manifesto" from the perspective of major figures and works, and transatlantic exchanges with figures from the European avant-gardes. Includes analysis of *antropofagia* as a post-colonial strategy. Reading knowledge of French and Portuguese helpful but not required. WR, HU TR

* **LAST 394a / LITR 294a / PORT 394a, World Cities and Narratives** Kenneth David Jackson

Study of world cities and selected narratives that describe, belong to, or represent them. Topics range from the rise of the urban novel in European capitals to the postcolonial fictional worlds of major Portuguese, Brazilian, and Lusophone cities. Conducted in English. WR, HU TR

* **LAST 491a or b, The Senior Essay** Staff

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.

Linguistics (LING)

LING 101a, Introduction to English Words Jim Wood

Where do the words of English come from, and where do they go? When do words stick around, and when do they fade? What is the difference between informal speech

and slang? This course introduces students to the study of language through the lens of English word structure, with occasional glances at the structure of words in other languages of the world. We study different ways of forming new words from prefixes and suffixes, as well from compounding, blending, and other more exotic processes. We study the sound structure of words and how they are used in sentences. We study what happens when English adopts words from other languages, and when English words are used in other languages, and how words change their sound, shape, and meaning over time. Finally, we discuss the different 'effects' that different words might have in conversation, and the issues that word choice raises in society at large. so

* **LING 106b, Illusions of Language** Joshua Phillips

Introduction to linguistics, with special emphasis on sociolinguistics and psycholinguistics. Study of grammatical illusions: expressions the parser mistakenly accepts as grammatical despite making little sense and grammatical sentences which the parser has difficulty processing. Emphasis also on illusions and misconceptions about language, such as the belief that women speak more than men, that "vocal fry" can harm your voice, and that double negation is illogical. so

* **LING 107b / ER&M 207b, Linguistic Diversity and Endangerment** Joshua Phillips

Introduction to the complexity of the question "How many languages are there in the world?" Geographical and historical survey of the world's languages; consideration of the ways in which languages can differ from one another. Language endangerment and the threat to world linguistic diversity it poses. Language reclamation and revitalization. None

LING 110a, Language: Introduction to Linguistics Claire Bowers

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

LING 112a, Historical Linguistics Chelsea Sanker

Introduction to language change and language history. How do people use language, and how does that lead to language change over time: sound change, analogy, syntactic and semantic change, borrowing. Techniques for recovering earlier linguistic stages: philology, internal reconstruction, the comparative method. The role of language contact in language change. Evidence from language in prehistory (doing archaeology with language). HU

* **LING 115a / SKRT 110a, 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 116b / CGSC 216b / PSYC 116b, Cognitive Science of Language Robert Frank

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 138a / SKRT 130a, 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 146b / PSYC 329b / WGSS 145b, 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. SO

* **LING 150a / ENGL 150a, Old English** Emily Thornbury

An introduction to the language, literature, and culture of earliest England. A selection of prose and verse, including riddles, heroic poetry, meditations on loss, a dream vision, and excerpts from *Beowulf*, which are read in the original Old English. HU

* **LING 211b, Grammatical Diversity in U.S. English** Raffaella Zanuttini

Language as a system of mental rules, governing the sound, form, and meaning system. The (impossible) distinction between language and dialect. The scientific study of standard and non-standard varieties. Social attitudes toward prestige and other varieties; linguistic prejudice. Focus on morpho-syntactic variation in North-American English: alternative passives ("The car needs washed"), personal datives ("I need me a new printer"), negative inversion ("Don't nobody want to ride the bus"), "drama SO" ("I am SO not going to study tonight"). SO

* **LING 212b, Linguistic Change** Chelsea Sanker

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. SO

LING 217a / EDST 237a / PSYC 317a, 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

LING 219a / ANTH 380a, The Evolution of Language and Culture Claire Bowers

Introduction to cultural and linguistic evolution. How human language arose; how diversity evolves; how innovations proceed through a community; who within a community drives change; how changes can be “undone” to reconstruct the past. Methods originally developed for studying evolutionary biology are applied to language and culture. WR, SO

LING 220a / PSYC 318a, General Phonetics Jason Shaw

Investigation of possible ways to describe the speech sounds of human languages. Acoustics and physiology of speech; computer synthesis of speech; practical exercises in producing and transcribing sounds. SO

LING 224a, 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

LING 231b / PSYC 331b, 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. SO

*** LING 232b, 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. SO

LING 233a, The Literate Brain and Mind Staff

The development of fluent reading and writing skills in children is essential for achieving success in the modern world, yet significant numbers of people from all languages and cultures fail to obtain adequate literacy outcomes. This course examines: 1) the genetic neurobiological and cognitive foundations of reading and writing, 2) how learning to read both depends upon and changes oral language systems in the brain, 3) how insights from cognitive neuroscience inform our understanding of teaching and remediation of language and literacy disorders, and 4) how all of this is both similar and dissimilar across contrastive written languages and diverse cultures. Students acquire familiarity with multiple brain imaging tools and what we need to do to deliver

on the promise of neuroscience in education. LING 110 or CGSC 110 is recommended, but not required. SO

*** LING 234b, Quantitative Linguistics** Chelsea Sanker

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 235a, Phonology II** Natalie Weber

Topics in the architecture of a theory of sound structure. Motivations for replacing a system of ordered rules with a system of ranked constraints. Optimality theory: universals, violability, constraint types and their interactions. Interaction of phonology and morphology, as well as the relationship of phonological theory to language acquisition and learnability. Opacity, lexical phonology, and serial versions of optimality theory. Prerequisite: LING 232 or permission of instructor. SO RP

*** LING 236b, 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 238b, Encoding Speech in Minds and Machines Jason Shaw

This class introduces analytical tools that support quantitative reasoning about speech. Methods for encoding speech in computer applications are considered alongside theories of how speech is represented in human minds. The purpose in examining these two areas together is to explore the degree to which theories of the mental representation of speech can inform smart computer applications and the degree to which machine learning techniques can advance the study of the human mind. Topics include computational modelling of speech movements, the resulting speech signal, human speech perception behavior, as well as relevant computational tools for signal processing, feature extraction, and machine learning. No prior experience with Matlab or R is required but some general familiarity with programming is required. QR, SO

*** LING 241a, Field Methods** Chelsea Sanker

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 253a, Syntax I Raffaella Zanuttini

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. Secondly, 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

LING 254b, 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 263a, Semantics I Veneta Dayal

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. QR, SO

LING 271a / PHIL 271a, Philosophy of Language Jason Stanley

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

LING 275b / CGSC 275b / PHIL 280b, Pragmatics Laurence Horn

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 278a, Topics in Semantics: Time & Possibility** Joshua Phillips

What are the mechanisms by which natural languages "displace" discourse in terms of time and possibility space? An introduction to a range of temporal and modal phenomena as exhibited in natural language. We develop formal/model-theoretic

tools based on intensional logics in view of better understanding the meaning of tense, aspectual and modal operators, the structure of these semantic domains, and their relation to other linguistic categories (including negation & evidentiality.) Pre- or co-requisite: LING 263 (or other introduction to formal semantics) or permission of instructor. HU

* **LING 327a / ARBC 450a / NELC 453a, 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 140 and permission of instructor.

* **LING 332a, Linguistic Structure in Speech Planning and Production** Jason Shaw

How do the cognitive processes involved in speech production relate to linguistic structure, including the morphological and phonological structure of words? This seminar engages with this question by bringing together primary readings on (1) neurocognitive models of speech motor control and (2) language-specific phonetic patterns, as they relate to morphological and phonological structure. Prerequisite: LING 220, LING 235, LING 236, LING 238, or permission of instructor. SO

* **LING 344a, Topics in Phonology: Prosody-Syntax Structure Correspondence** Natalie Weber

This course explores how languages organize sounds into domains arranged within a hierarchical structure. Research over the past 40 years has shown that this prosodic structure often matches syntactic and syllabic structure, but mismatches can arise due to phonological pressures and restructuring. We examine several theories of the relationship between syntactic and prosodic structure by discussing primary literature and data from a range of languages. The course culminates in an original research paper on a topic chosen by the student. Prerequisites: LING 232 and LING 253, or permission of instructor. Ling 235 is recommended, but not required. WR, SO

* **LING 365a, Semantic Change** Joshua Phillips

Investigation of systematic change in the domain of semantics and pragmatics. Empirical phenomena include grammaticalization in the domain of tense, aspect, and modality markers, markers of location and possession, and negation, as well as intensifiers. Focus on reconciling grammaticalization and typological research with formal semantic studies. Prerequisite: LING 263 or permission of instructor. SO

* **LING 372a, Meaning, Concepts, and Words** Maria Pinango

A cognitive approach to the structure of meaning from the perspective of the language system. The brain's finite collection of stored concepts, which are combined and recombined via predetermined principles. The system of associating combinations of concepts with combinations of words and sentences to produce an unlimited number of novel thoughts. Prerequisite: at least one course in linguistics, psychology, or cognitive science. SO

* **LING 379a / LING 381 / LING 781, 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 380a, Topics in Computational Linguistics: Neural Network Models of Linguistic Structure** Robert Frank

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 395b, What do Discourse Particles Mean?** Veneeta Dayal

This course probes the grammatical character of discourse particles, expressions that do not relate directly to the core meaning expressed by a construction: a proposition in the case of a declarative, a set of propositions in the case of an interrogative, and a directive in the case of an imperative. An example of a discourse particle is *again* in the question: *What is your name, again?* Discourse particles function instead to connect the core meaning of the construction to the context of utterance, introducing components of meaning that lie outside the linguistic domain, construed narrowly. Students read primary semantic literature on declaratives, interrogatives and imperatives to get a solid grounding in the theoretical issues surrounding their semantics and explore empirical phenomena related to discourse particles in a range of languages. Current semantic and pragmatic proposals designed to capture their meaning are critically evaluated. Prerequisite: LING 263 or permission of instructor. SO

*** LING 475b, Linguistic Meaning and Conceptual Structure** Maria Pinango

The meaning of a word or sentence is something in the human mind that has specific properties: it can be expressed (written/signed/spoken forms); it can be combined with other meanings; its expression is not language dependent; it connects with the world; it serves as a vehicle for inference; and it is hidden from awareness. The course explores these properties in some detail and, in the process, provides the students with technical vocabulary and analytical tools to further investigate them. The course is thus intended for those students interested in undertaking a research project on the structure of meaning, the nature of lexico-conceptual structure, that is, the structure of concepts which we refer to as "word meanings", and how they may be combined through linguistic and non-linguistic means. Its ultimate objective is to bridge models of conceptual structure and models of linguistic semantic composition, identify their respective strengths and weaknesses and explore some of the fundamental questions that any theory of linguistic meaning composition must answer. Evidence discussed will emerge from naturalistic, introspectional, and experimental methodologies. Prerequisites: LING 110, CGSC 110, LING 217, or LING 263. SO

*** LING 490a, Research Methods in Linguistics** Raffaella Zanuttini

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 491b, The Senior Essay** Jim Wood

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 106b, The Shape of Space Ian Adelstein

This course provides an introduction to mathematical thinking through ideas in geometry and graph theory. Traditional lecture, worksheets, discussion, group work, and classroom activities all contribute to a dynamic learning experience. The course follows a historical narrative, starting from antiquity, to understand the foundations of mathematical thought. An axiomatic approach to geometry affords students the opportunity to construct proofs of classical theorems. The basics of graph theory are introduced in order to explore real world problems such as map coloring and bridge crossing. The ancient Greek method of exhaustion previews a discussion of the integral, and from here we explore the beautiful relationship between the geometry and topology of graphs, polyhedra, and surfaces. Throughout the course students build their mathematical and geometric intuition through problem solving and exercises in geometric imagining. Permission of instructor required. Enrollment limited to 25 students who have not previously taken a high school or college calculus course. QR

*** MATH 107a, Mathematics in the Real World** Rachel Diethorn

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 108b, Estimation and Error Staff

A problem-based investigation of basic mathematical principles and techniques that help make sense of the world. Estimation, order of magnitude, approximation and error, counting, units, scaling, measurement, variation, simple modeling. Applications to demographics, geology, ecology, finance, and other fields. Emphasis on both the practical and the philosophical implications of the mathematics. Permission of instructor required. Enrollment limited to 25 students who have not previously taken a high school or college calculus course. QR

*** MATH 110a, Introduction to Functions and Calculus I** Staff

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. Placement into MATH 110 on the Mathematics placement exam is required. Enrollment in MATH 110 is through preference selection. QR

*** MATH 111b, Introduction to Functions and Calculus II** Staff

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. Prerequisite: MATH 110. Enrollment in MATH 111 is through preference selection.

QR

*** MATH 112a or b, Calculus of Functions of One Variable I** Staff

Limits and their properties. Definitions and some techniques of differentiation and the evaluation of definite integrals, with applications. Use of the software package Mathematica to illustrate concepts. 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. Enrollment in MATH 112 is through preference selection. QR

*** MATH 115a or b, Calculus of Functions of One Variable II** Staff

A continuation of MATH 112. Applications of integration, with some formal techniques and numerical methods. Improper integrals, approximation of functions by polynomials, infinite series. Prerequisite: MATH 111 or MATH 112, or placement into MATH 115 on the Mathematics placement exam. May not be taken after MATH 116. Enrollment in MATH 115 is through preference selection. QR

*** MATH 116a, 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 115/116 on the Mathematics placement exam. May not be taken after MATH 115. QR

*** MATH 118a 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 or 222. Prerequisite: MATH 112. QR

*** MATH 120a or b, Calculus of Functions of Several Variables** Staff

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. Enrollment in MATH 120 is through preference selection. QR

*** MATH 121b, Mathematical Models in the Biosciences II: Advanced Techniques**

John Hall

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 222a or b / AMTH 222a 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 225a 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. Prerequisite: MATH 115 or equivalent. May not be taken after MATH 222, 226, or 231. QR

*** MATH 226a, Linear Algebra (Intensive)** Staff

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 240b, Advanced Linear Algebra Subhadip Dey

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. After MATH 225 or 226 or 231.

MATH 241a / S&DS 241a, Probability Theory Yihong Wu

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 242b / S&DS 242b, Theory of Statistics Andrew Barron and William Brinda
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 244a or b / AMTH 244a 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. Recommended preparation: MATH 115 or equivalent. QR

MATH 246a 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 251b / EENG 434b / S&DS 351b, Stochastic Processes Staff
Introduction to the study of random processes including linear prediction and Kalman filtering, Poisson 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 255a 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 and serves as an introduction to writing mathematical proofs. Prerequisite: MATH 115 or equivalent. MATH 225 or 226 is recommended but not required. May not be taken after MATH 256, 300, or 301. QR

* **MATH 256b, Analysis 1 (Intensive)** Yair Minsky
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. MATH 225 or 226 is recommended but not required. May not be taken after MATH 255, 300, or 301. QR

MATH 270a, Set Theory James Barnes
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 302a, Vector Analysis and Integration on Manifolds Andrew Neitzke
A rigorous treatment of the modern toolkit of multivariable calculus. Differentiation and integration in \mathbb{R}^n . Inverse function theorem. Fubini's theorem. Multilinear algebra and differential forms. Manifolds in \mathbb{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 305b, Analysis 2: Lebesgue Integration and Fourier series Hee Oh

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 310a, Introduction to Complex Analysis Franco Vargas Pallete

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 315b, 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 RP

* **MATH 320a, Measure Theory and Integration** Staff

Construction and limit theorems for measures and integrals on general spaces; product measures; L_p spaces; integral representation of linear functionals. After MATH 305 or equivalent. QR RP

* **MATH 325b, Introduction to Functional Analysis** Wilhelm Schlag

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 330a / S&DS 400a, Advanced Probability Sekhar Tatikonda

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 345a, Modern Combinatorics** Andrei Pohoata

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, Szemerédi's theorem and lemma, and Green-Tao's theorem. Prerequisite: MATH 244. QR

MATH 350a or b, Introduction to Abstract Algebra Staff

Group theory, structure of Abelian groups, and applications to number theory. Symmetric groups and linear groups including orthogonal and unitary groups; properties of Euclidean and Hermitian spaces. Some examples of group representations. Modules over Euclidean rings, Jordan and rational canonical forms of a linear transformation. 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, or MATH 230 and 231, or MATH 225 and 250.) QR

*** MATH 354b, Number Theory** Congling Qiu

Prime numbers; quadratic reciprocity law, Gauss sums; finite fields, equations over finite fields; zeta functions. After MATH 350. QR

MATH 360b, Introduction to Lie Groups Staff

Lie groups as the embodiment of the idea of continuous symmetry. The exponential map on matrices and applications; spectral theory; examples and structure of Lie groups and Lie algebras; connections with geometry and physics. After MATH 350 and MATH 302. With permission of instructor, may be taken after Math 350 and Math 231 or 250. QR

MATH 370b, Fields and Galois Theory Miki Havlickova

Rings, with emphasis on integral domains and polynomial rings. The theory of fields and Galois theory, including finite fields, solvability of equations by radicals, and the fundamental theorem of algebra. Quadratic forms. After MATH 350. QR

MATH 373a, Algebraic Number Theory Congling Qiu

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; adèles and ideles; zeta functions. Prerequisites: MATH 310 and 370. QR

MATH 380a, Modern Algebra I 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 421b / AMTH 420b, The Mathematics of Data Science Anna Gilbert

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 430b, Introduction to Algebraic 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 440a, Introduction to Algebraic Geometry Staff

Students develop the theory of algebraic varieties, which are zero sets of polynomial equations, starting with basic commutative algebra and include Groebner basis, chain conditions, and the ideal membership problem. Additional varieties include affine, projective, quasi-projective. We prove Hilbert's Nullstellensatz (one of the most important theorems of classical algebraic geometry) and discuss different notions of dimension and how they relate. We define maps between varieties, morphisms, rational, and birational maps. The remaining topics are (but are not limited to) singularity theory, normalization and blowups, elimination theory, resultants, and

divisors on algebraic varieties. Some focus on computational aspects of algebraic geometry is included. Prerequisites: MATH 310 and MATH 350. QR

MATH 447a / AMTH 447, Partial Differential Equations John Schotland
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 305

MATH 470a or b, Individual Studies Staff
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 475a or b, Senior Essay Staff
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 480a 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. Enrollment limited to seniors majoring in Mathematics, Economics and Mathematics, or Mathematics and Philosophy.

* **MATH 481b, Senior Seminar: Topics in Economics and Mathematics** Andrei Pohoata and Dirk Bergemann
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. Enrollment limited to seniors majoring in Mathematics, Economics and Mathematics, or Mathematics and Philosophy.

Mechanical Engineering (MENG)

MENG 185a 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

MENG 211b, Thermodynamics for Mechanical Engineers Judy Cha
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 RP

MENG 280a, Mechanical Engineering I: Strength and Deformation of Mechanical Elements Diana Qiu

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 285a, 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 286La or b, Solid Mechanics and Materials Science Laboratory Staff

Experiments that involve either structural mechanics or materials science. Comparisons between structural theories and experimental results. Relationships among processing, microstructure, and properties in materials science. Introduction to techniques for the examination of the structure of materials. SC RP ½ Course cr

*** MENG 320a / ENRG 320a / ENVE 320a, Energy, Engines, and Climate** Alessandro Gomez

The course aims to cover the fundamentals of a field that is central to the future of the world. The field is rapidly evolving and, although an effort will be made to keep abreast of the latest developments, the course emphasis is on timeless fundamentals, especially from a physics perspective. Topics under consideration include: key concepts of climate change as a result of global warming, which is the primary motivator of a shift in energy supply and technologies to wean humanity off fossil fuels; carbon-free energy sources, with primary focus on solar, wind and associated needs for energy storage and grid upgrade; traditional fossil-fuel power plants and engines, that are currently involved in 85% of energy conversion worldwide and we can't "turn on a dime". Elements of thermodynamics are covered throughout the course as needed, including the definition of various forms of energy, work and heat as energy transfer, the principle of conservation of energy, first law and second law, and rudiments of heat engines. We conclude with some considerations on energy policy and with the "big picture" on how to tackle future energy needs. Designed for juniors and seniors in science and engineering. Prerequisite: MENG 211 or permission from the instructor.

QR, SC

*** MENG 325a, Machine Elements and Manufacturing Processes** Joran Booth

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 361a, 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 363Lb, Fluid Mechanics and Thermodynamics Laboratory** Alessandro Gomez

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 RP

MENG 365b, Chemical Propulsion Systems Juan de la Mora
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. MENG 361 or permission of instructor. QR, SC RP

MENG 383b, Mechanical Engineering III: Dynamics Corey O'Hern
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 389b, Mechanical Engineering IV: Fluid and Thermal Energy Science Staff
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 390b, Mechatronics Laboratory Staff
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 400a or b, Computer-Aided Engineering Ronald Adrezin
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 403a, Introduction to Nanomaterials and Nanotechnology Judy Cha
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 404b / BENG 404b, 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.

MENG 441a / ENAS 441a, 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 464b, 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

* **MENG 469a, 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 471a and MENG 472b, Special Projects I** Corey O'Hern
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 487La / MENG 488Lb, Mechanical Design: Process and Implementation I

Joran Booth

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 488Lb / MENG 487La, Mechanical Design: Process and Implementation II

Joran Booth

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

Modern Greek/Hellenic Studies (MGRK)

MGRK 110a, Elementary Modern Greek I Maria Kaliambou

An introduction to modern Greek, with emphasis on oral expression. Use of communicative activities, graded texts, written assignments, grammar drills, audiovisual material, and contemporary documents. In-depth cultural study. L1
1½ Course cr

MGRK 120b, Elementary Modern Greek II Maria Kaliambou

Continuation of MGRK 110. Prerequisite: MGRK 110. L2 1½ Course cr

* **MGRK 130a, Intermediate Modern Greek I** Maria Kaliambou

Further development of oral and written linguistic skills, using authentic readings and audiovisual materials. Continued familiarization with contemporary Greek culture. Prerequisite: MGRK 120 or equivalent. L3 1½ Course cr

* **MGRK 140b, 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

* **MGRK 212b, Folktales and Fairy Tales** Maria Kaliambou

History of the folktale from the late seventeenth through the late twentieth centuries. Basic concepts, terminology, and interpretations of folktales, with some attention to twentieth-century theoretical approaches. Performance and audience, storytellers, and gender-related distinctions. Interconnections between oral and written traditions in narratives from western Europe and Greece. HU TR

* **MGRK 216a / CLCV 216a / LITR 239a / WGSS 209a, 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

* **MGRK 236b / PLSC 138b / SOCY 221b, The Euro Crisis** Paris Aslanidis

Examination of how Europe continues to struggle with the social and economic repercussions of the Great Recession and the impact of socioeconomic asymmetries in countries such as Portugal, Ireland, Spain, Italy, and Greece. Topics include the euro as a viable common currency; why and how the Euro crisis erupted and spread; how the COVID-19 fallout will impact the Union. SO

* **MGRK 237a / GLOBL 215a / LAST 386a / PLSC 375a / SOCY 389a, Populism** Paris

Aslanidis

Investigation of the populist phenomenon in party systems and the social movement arena. Conceptual, historical, and methodological analyses are supported by comparative assessments of various empirical instances in the US and around the world, from populist politicians such as Donald Trump and Bernie Sanders, to populist social movements such as the Tea Party and Occupy Wall Street. SO

* **MGRK 238a / FILM 341a / WGSS 233a, 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. None HU

* **MGRK 300b / CLCV 319b / HIST 242Jb / WGSS 293b, 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

* **MMGRK 305a / HIST 294Ja, The Age of Revolution** Paris Aslanidis

The course is a comparative examination of the international dimensions of several revolutions from 1776 to 1848. It aims to explore mechanisms of diffusion, shared themes, and common visions between the revolutionary upheavals in the United States, France, Haiti, South America, Greece, and Italy. How similar and how different were these episodes? Did they emerge against a common structural and societal backdrop? Did they equally serve their ideals and liberate their people against tyranny? What was the role of women and the position of ethnic minorities in the fledgling nation-states? As the year 2021 marks the bicentennial of the Greek Revolution of 1821, special attention is given to the intricate links forged between Greek revolutionary intellectuals and their peers in Europe and other continents HU

Modern Middle East Studies (MMES)

MMES 102b / HIST 381b / NELC 102b / SOCY 102b, Introduction to the Middle East

Jonathan Wyrzten

Introduction to the history, politics, societies, and cultures of the Middle East. Topics and themes include geopolitics, environment, state formation, roles of Judaism/Christianity/Islam, empire&colonialism, nationalism, regional & global wars, Palestine-Israel conflict, US and other Great Power intervention. HU, SO

MMES 121a / PLSC 121a, International Relations of the Middle East Nicholas Lotito

This course explores the multiple causes of insecurity in the Middle East and North Africa, a region of paramount geostrategic interest, whose populations have suffered from armed conflicts both within and across national borders. The first half of the course interrogates traditional security concepts like war, terrorism, and revolution, as well as the political, economic, and social contexts which give rise to these phenomena. The course then turns to foreign policy analysis in case studies of the region's major states. Previous coursework in international relations and/or Middle East politics or history recommended but not required. SO

MMES 149a / ER&M 219a / HIST 219a / JDST 200a / RLST 148a, Jewish History and Thought to 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

* **MMES 150a / HEBR 150a / JDST 213a, Advanced Modern Hebrew: Daily Life in Israel** Orit Yeret

An examination of major controversies in Israeli society. Readings include newspaper editorials and academic articles as well as documentary and historical material. Advanced grammatical structures are introduced and practiced. Conducted in Hebrew. Prerequisite: HEBR 140 or equivalent. L5 RP

* **MMES 155b / HEBR 160b / JDST 360b, Hebrew in a Changing World** Dina Roginsky

Focus on how Hebrew language is used in Israel for constructing social norms, expectations, and day-to-day experiences. Topics include gendered language, political and PC language, military language, slang, humor, dialects, accents, name-giving practices, language in a sacred and in a secular context, and Americanization of the Hebrew language. Materials include advertisements, internet forums, movie clips, skits, maps, political stickers, and newspapers. Prerequisite: HEBR 140 or permission of instructor. L5

* **MMES 159b / HEBR 159b / JDST 409b, 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 140 or permission of instructor. L5 RP

* **MMES 161a / HEBR 162a / JDST 319a, Israel in Ideology and Practice** Dina Roginsky

An advanced Hebrew class focusing on changing ideology and politics in Israel. Topics include right and left wing political discourse, elections, State-Religion dynamics, the Jewish-Arab divide, and demographic changes. Materials include newspapers, publications, on-line resources, speeches of different political and religious groups, and contemporary and archival footage. Comparisons to American political and ideological discourse. Prerequisite: HEBR 140 or permission of instructor. L5 RP

* **MMES 167b / HEBR 164b / JDST 417b, 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 171b / NELC 402b, The Islamic Near East from Muhammad to the Mongol Invasion Kevin van Bladel

The shaping of society and polity from the rise of Islam to the Mongol conquest of Baghdad in 1258. The origins of Islamic society; conquests and social and political assimilation under the Umayyads and Abbasids; the changing nature of political legitimacy and sovereignty under the caliphate; provincial decentralization and new sources of social and religious power. HU

* **MMES 172a / ARBC 178a, Yemeni Literature & Culture** Muhammad Aziz

This seminar introduces students to a variety of Yemeni novels, short stories, poetry, history, movies, songs, and culture. We delve deeply into the major Yemeni literary styles, in their forms of poetry, prose, movies, and series. A general sense of the transitional period between past and present in the modern era. Students are expected to read the material at home and prepare for class discussions. Students grasp some sense of Yemeni history as well as literature in general. Prerequisite: ARBC 151. L5

* **MMES 177b / ARBC 171b / ARBC 527b / LITR 267b / NELC 237b / NELC 598b, Hunger in Eden: Mohamed Choukri's Narratives** Jonas Elbousty

A survey of the work of Mohamed Choukri, one of the most prominent Moroccan, if not Arab, writers to have shaped the modern Arabic literary canon. His influence has been instrumental in forming a generation of writers and enthusiastic readers, who fervently cherish his narratives. Students dive deeply into Choukri's narratives, analyzing them with an eye toward their cultural and political importance. The class looks to Choukri's amazing life story to reveal the roots of his passion for writing and explores the culture of the time and places about which he writes. Through his narratives, students better understand the political environment within which they were composed and the importance of Choukri's work to today's reader regarding current debates over Arab identity. This class surveys the entirety of his work, contextualizing within the sphere of Arabic novelistic tradition. Prerequisite: ARBC 151, L4 or equivalent, or permission from the of instructor. L5

* **MMES 179a / NELC 169a / PERS 180a, Reading Persian Texts** Farkhondeh Shayesteh

Students are presented with opportunities to enhance their knowledge of Persian, with primary focus on reading skills. The course involves reading, analyzing, and in-class discussion of assigned materials in the target language. Authentic reading excerpts from history, art, philosophy, and literature, as well as art history materials from medieval to modern times are used. This course is taught in Persian. Prerequisite: L4 and instructor permission. L5

MMES 215b / ENGL 191b / HUMS 206b / LITR 318b / NELC 201b, The Arabian Nights, Then and Now Robyn Creswell

Exploration of *Arabian Nights*, a classic of world literature. Topics include antecedents, themes and later prose, and graphic and film adaptations. HU

* **MMES 261b / AFST 414b / FREN 414b / LITR 269b, Afterlives of Algeria's Revolution** Jill Jarvis

The Algerian War for Independence from France was the longest and most violent decolonizing war of the 20th century. This war and its aftermath transformed political, social, intellectual, and artistic life on both sides of the Mediterranean—and it became a model for other decolonizing and civil rights movements across the world. Memory of this war continues to shape current debates in Europe and North Africa about state violence, terrorism, racism, censorship, immigration, feminism, human rights, and justice. Through study of fiction, film, testimonies, graphic novels, and theater, this seminar charts the war's surprising and enduring legacies. Films may include Pontecorvo's *The Battle of Algiers*, Haneke's *Caché*, and Panijel's *Octobre à Paris*. Literary works by Djebar, Camus, Sebbar, Etcherelli, Dib, Cixous, Kateb, Fanon, De Beauvoir, Mechakra. The course is conducted in French. If you have any questions about your French ability, contact the instructor. L5, HU

* **MMES 271a / GLBL 271a, Middle East Politics** Emma Sky

Exploration of the international politics of the Middle East through a framework of analysis that is partly historical and partly thematic. How the international system, as well as social structures and political economy, shape state behavior. Consideration of Arab nationalism; Islamism; the impact of oil; Cold War politics; conflicts; liberalization; the Arab-spring, and the rise of the Islamic State. SO

MMES 290a / PLSC 435a / RLST 290a, Islam Today: Jihad and Fundamentalism

Frank Griffel

Introduction to modern Islam, including some historical background. Case studies of important countries in the contemporary Muslim world, such as Egypt, Iran, Pakistan, and Saudi Arabia. Islam as a reactive force to Western colonialism; the ideals of Shari'a and jihad; violence and self-sacrifice; and Islam as a political ideology. HU

*** MMES 300a / HIST 398Ja / RSEE 329a / RUSS 329a, Introduction to Modern Central Asia** Staff

An overview of the history of modern Central Asia—modern-day Kazakhstan, Kyrgyzstan, Turkmenistan, Tajikistan, Uzbekistan, and the Xinjiang Uyghur Autonomous Region of the People's Republic of China. This course shows Central Asia to be a pivotal participant in some of the major global issues of the 20th and 21st centuries, from environmental degradation and Cold War, to women's emancipation and postcolonial nation-building, to religion and the rise of mass society. It also includes an overview of the region's longer history, of the conquests by the Russian and Chinese empires, the rise of Islamic modernist reform movements, the Bolshevik victory, World War II, the *perestroika*, and the projects of post-Soviet nation-building. Readings in history are supplemented by such primary sources as novels and poetry, films and songs, government decrees, travelogues, courtly chronicles, and the periodical press. All readings and discussions in English. HU

*** MMES 303a / HIST 311Ja, Social Movements in the Modern Middle East and North Africa** Staff

How have social movements and grassroots networks shaped politics, culture, and day-to-day realities in the contemporary Middle East and North Africa (MENA)? This seminar addresses such driving questions by way of readings and discussion on a range of movements and ideological currents in the MENA region from the late nineteenth century to present, including labor, socialism, feminism, Islamism, Third Worldism, and nationalism in its various forms. Moving between local, national, regional, and global perspectives, we explore the social and political contexts in which these movements developed; the various ways in which they negotiated structures of power; and their impact on culture, sociality, and politics. WR, HU

*** MMES 311a / FILM 336a / RLST 256a, Social Change in Middle East Cinemas** Staff

This course invites students to explore how modern aesthetic forms such as cinemas from the Middle East and North Africa critique rigid social realities and imagine modern social experiences, thereby pushing boundaries towards social change. By chronologically examining Arabic, Turkish, Hebrew, and Persian films in different historical periods, we will explore how film as art reveals the nature of social myth and the role public intellectuals play in perpetuating or challenging that myth. In addition to weekly film screenings (with English subtitles), course material includes short readings on the modern history of the region, history of film production, and analysis of film as art. By the end of this course, students will learn about the history of filmmaking in the MENA region, the different questions (religion, class, language, gender, ethnicity, race, nationalism and colonialism) influencing the production and reception of film, the challenges facing the filmmaker as an artist and producer and more importantly how these challenges impact the imagination of social change on the screen.

* **MMES 318a / GBLB 218a / PLSC 193a, Security in North Africa and the Middle East**
Staff

This course explores the debates about regional security in North Africa and the Middle East, mainly from a critical security perspective. Traditional and non-traditional security challenges are discussed throughout the semester. The state is presented as much a subject of security as a subject of insecurity for individuals and groups of people. This is to say that security here is not state-centered. North Africa and the Middle East are mostly dealt with separately, with very few exceptions. SO

* **MMES 322b / HIST 324Jb / SOCY 320b, World War I and the Making of the Modern Middle East** Jonathan Wyrzten

WWI fundamentally transformed the Middle East, unmaking the Ottoman Empire and unleashing competition among colonial and local actors to reshape region's political order that lasted well into the 1930s. This seminar examines what can be called the "Long Great War" in the Middle East. The first part examines the road to World War I and the course of the war in the Middle Eastern theater's principle fronts (Caucasus, Mesopotamia, Sinai/Syria, North Africa, Dardanelles). We then look at the period immediately following the October 1918 Mudros Armistice (that technically ended Allied/Ottoman hostilities). During this violent "Wilsonian Moment" in the Middle East, local aspirations for self-determination were articulated, reformulated, and argued locally and internationally while colonial actors – British, French, Italian, and Spanish – mobilized competing state-building projects. The last section of the course looks at the climax points of conflict between these competing projects in the mid to late 1920s – including the Great Syrian Revolt, the Rif War, Kurdish Revolts, Saudi wars of consolidation, and the Italo-Sanusi war in Libya – and how present-day political units were finally negotiated. We conclude discussing how the Long Great War continues to echo and resonate in contemporary upheaval in the Middle East a century later. HU, SO

* **MMES 360b / AFST 425b / FREN 425b, North African French Poetry** Thomas Connolly

Introduction to North African poetry composed in French during the twentieth and twenty-first centuries. Works explored within the broader context of metropolitan French, Arabic, and Berber cultures; juxtaposition with other modes of expression including oral poetry, painting, dance, music, the Internet, and film. The literary, aesthetic, political, religious, and philosophical significance of poetic discourse. L5, HU

* **MMES 365a / HEBR 170a / JDST 421a, Contemporary Israeli Art (1948 until today)**
Orit Yeret

An advanced level Modern Hebrew course which focuses on contemporary Israeli art, from 1948 until today. The course aims to expand student's knowledge of the Hebrew language and refine their writing, reading, speaking, and listening skills through the exposure to authentic materials in the field of the visual arts. Students engage with diverse Israeli visual art productions – such as: paintings, drawings, sculpture, photography, new media etc. – and employ critical thinking to discuss and analyze a variety of art pieces. Prerequisite: Completion of L4 (Modern Hebrew) or a placement exam. L5 RP

* **MMES 399a / ANTH 441a / MMES 430a / WGSS 430a, Gender and Citizenship in the Middle East** Eda Pepi

Examination of the gendered and sexual dimensions of war, conflict, and partition, and the codification of modern citizenship in the Middle East – from Syria, to the Middle

East conflict, to Western Sahara, among others – this course presents ethnographic, historical, and literary scholarship that theorizes the role of kinship and citizenship in narratives of the nation and sovereignty. SO

* **MMES 402a / AFST 443a / FREN 442a / LITR 484a, Decolonizing Memory : Africa & the Politics of Testimony** Jill Jarvis

This seminar explores the politics and poetics of memory in a time of unfinished decolonization. It also provides students with a working introduction to anticolonial, postcolonial, and decolonial critique. Together we bring key works on the topics of state violence, trauma, and testimony into contact with literary works and films by artists of the former French and British empires in Africa. Reading literary and theoretical works together permits us to investigate archival silences and begin to chart a future for the critical study of colonial violence and its enduring effects. Literary readings may include works by Djébar, Rahmani, Ouologuem, Sebbar, Diop, Head, Krog. Films by Djébar, Leuvre, Sembène, and Sissako. Theoretical readings may include works by Arendt, Azoulay, Césaire, Derrida, Fanon, Mbembe, Ng#g#, Spivak, and Trouillot. WR, HU

* **MMES 430a / ANTH 441a / MMES 399a / WGSS 430a, Gender and Citizenship in the Middle East** Eda Pepi

This seminar explores the gendered and ethnic-based social processes and forms of power that citizenship, statelessness, and migration crises fuel, and are fueled by, in the Middle East and North Africa. The history of gender and citizenship in the region is imbricated in ethnosexual and orientalist colonial legacies that articulate a racialized problematic of “modernity.” Part of these legacies involve obscuring the role that women, sexual minorities, and gender, more broadly, have played in framing citizenship and statehood in the Middle East in global, regional, and local imaginations not only as border policing and legal doctrine, but as signifier – and *reifier* – of culture, race, and ethnicity. By examining the gendered and sexual dimensions of war, conflict, and partition, and the formation of modern citizenship in the Middle East, the seminar presents ethnographic, historical, literary and visual scholarship that theorizes the role of kinship and citizenship in gendered and racialized narratives of the nation and political sovereignty. SO

* **MMES 490a / NELC 490a / RLST 445a, Introduction to Arabic and Islamic Studies** Frank Griffel

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.

Modern Tibetan (MTBT)

View Courses

Molecular Biophysics and Biochemistry (MB&B)

* **MB&B 050b, 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. Preregistration required; see under First-Year Seminar Program. WR, SC

MB&B 105a or b / MCDB 105a or b, Biology, the World, and Us Staff

Biological concepts taught in context of current societal issues, such as emerging diseases, genetically modified organisms, green energy, and the human brain and its disorders. Emphasis on biological literacy to enable students to evaluate scientific arguments. SC

* **MB&B 200a or b / MCDB 300a 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. Prerequisites: BIOL 101 or equivalent performance on the corresponding biological sciences placement examination; one term of organic chemistry; or with permission of instructor. SC

* **MB&B 251La or b / MCDB 301Lb, Laboratory for Biochemistry** Staff

An introduction to current experimental methods in molecular biology, biophysics, and biochemistry. Limited enrollment. Requires preregistration by e-mail to aruna.pawashe@yale.edu prior to the first week of classes. Prerequisite: BIOL 101. SC
½ Course cr

* **MB&B 268b, Identity, Society, and STEM** Lilian Kabeche, Andrew Miranker, and Enrique De La Cruz

Matters of personal and group identity underpin the development of science as a discipline, the lived experience of its practitioners, and the achievement of excellence by diverse cultures collaborating on research, teaching in schools, treating the sick, promoting business, and setting government policy. Yale STEM students who are actively engaged in the study of any aspect of identity and society, whether contemporary or historical, learn how STEM is intertwined with these interests. To achieve this goal, students in this course must be simultaneously enrolled in a full-credit, humanities course at Yale. Instructor permission is required and is based on a proposal (250 words) that makes a compelling case for exploring STEM's engagement with the concurrent humanities course. Students use knowledge from the humanities course to develop a unique project that can include anecdotal sources, but must also include elements of formal scholarship learned in class. Primary scientific literature and publicly available data relevant to students' projects in any given semester are engaged and discussed during seminar-styled class meetings. Dissemination of projects take several forms including one appropriate for the public or popular press, a flash talk presentation open to the Yale community, and lastly a formal term-paper. Prerequisite: BIOL 101 (or permission of the instructor). SC ½ Course cr

MB&B 275a, Biology at the Molecular Level Enrique De La Cruz, Andrew Miranker, and Zachary Levine

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 300a, Principles of Biochemistry I Matthew Simon and Mark Solomon

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. After BIOL 101; after or concurrently with CHEM 175 (or CHEM 125) or 220 SC

MB&B 301b, 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 330a / BENG 230a / MCDB 330a / NSCI 324a, 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

MB&B 361b / BENG 465b / MCDB 361b / NSCI 325b, Modeling Biological Systems II
Thierry Emonet, Joe Howard, and Damon Clark

Advanced topics related to dynamical processes in biological systems. Processes by which cells compute, count, tell time, oscillate, and generate spatial patterns. Time-dependent dynamics in regulatory, signal-transduction, and neuronal networks; fluctuations, growth, and form. Comparisons between models and experimental data. Dynamical models applied to neurons, neural systems, and cellular biophysical

processes. Use of MATLAB to create models. Prerequisite: MCDB 330 or equivalent, or a 200-level biology course, or with permission of instructor. QR

*** MB&B 364a / MCDB 364a, Light Microscopy: Techniques and Image Analysis**

Joseph Wolenski and Scott Holley

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 365a, 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, MB&B 301, MB&B 200, or permission of the instructor. SC

MB&B 420a, Macromolecular Structure and Biophysical Analysis Yong Xiong, Joe

Howard, and Jack Zhang

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 425a / MCDB 425, 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 431b, Illuminating Biomolecular Mechanism with Structure Charles Sindelar, Julien Berro, and Nikhil Malvankar

This class focuses on methods for observing biomolecular structure and dynamics on the atomic and near-atomic length scales. Upon completion of the class, students have a working understanding of the theory that underpin methods such as cryo-electron microscopy and optical spectroscopy. All methods introduced are anchored to fundamental processes in biology and to biomedical advances through guided discussion of ground-breaking studies in contemporary primary literature. Prerequisite: MB&B 275, 301, or permission of the instructor. Enrolled students should have an introductory level understanding of Fourier transforms, linear/matrix algebra and multivariate calculus, but note, portions of class time are used to review the small subset of relevant mathematics essential for this course. QR, SC

MB&B 435a, Quantitative Approaches in Biophysics and Biochemistry Nikhil Malvankar and Yong Xiong

An introduction to quantitative methods relevant to analysis and interpretation of biophysical and biochemical data. Topics include statistical testing, data presentation, and error analysis; introduction to mathematical modeling of biological dynamics; analysis of large datasets; 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 443b, Advanced Eukaryotic Molecular Biology Mark Hochstrasser, Matthew Simon, Franziska Bleichert, and Wendy Gilbert

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 RP

* **MB&B 445b, Methods and Logic in Molecular Biology** Wendy Gilbert, Mark Hochstrasser, 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 RP

MB&B 449a, Medical Impact of Basic Science Joan Steitz, I. George Miller, David Schatz, Daniel DiMaio, Franziska Bleichert, Sandy Chang, and Karla Neugebauer

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 452b / MCDB 452b / S&DS 352b, 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

*** MB&B 459b / ENGL 459b / EVST 215b, 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. WR RP

*** MB&B 460Lb, Advanced Laboratory for Biochemistry** Staff

This is a project-oriented course in which each student tackles a unique research problem of their own design. Students learn cutting-edge molecular evolution techniques to create a new DNA structure that can specifically recognize and bind whatever target material they choose. Useful and transferrable skills include biomolecular engineering and next generation DNA sequencing. Students learn from each other as they each report on their progress. The course is open to students interested in augmenting the research they are already doing or to students who simply prefer hands-on learning. Prerequisite: MB&B 251L or permission of the instructor. Some students may take this course concurrently with MB&B 251L if they have sufficient prior knowledge of organic chemistry, biochemistry, and basic biochemical lab techniques. SC ½ Course cr

*** MB&B 470a and MB&B 471b, Research in Biochemistry and Biophysics for the Major** Karla Neugebauer

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. SC

*** MB&B 472a and MB&B 473b, Research in Biochemistry and Biophysics** Karla Neugebauer

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 are graded pass/fail. Taken after students have completed two credits of MB&B 470 and 471. These courses

do not count toward the major requirements. Prerequisites: MB&B 470, 471 and 251L or permission of the instructor. SC

* **MB&B 478a and MB&B 479b, Intensive Research in Biochemistry and Biophysics**

Karla Neugebauer

Individual laboratory projects under the supervision of a faculty member. Students must submit an enrollment form that specifies the research supervisor by the day that course schedules are due. Students are expected to commit at least twenty 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. No more than two course credits count as electives toward the B.S. degree. Enrollment limited to senior MB&B majors. Prerequisite: MB&B 251L or 360L. 2 Course cr per term

* **MB&B 490b, The Senior Project** Dieter Soll, Christian Schlieker, and Nikhil Malvankar

Colloquium for fulfillment of the senior requirement. The course involves a written and an oral presentation of a senior paper in an area of biochemistry or biophysics. The topic is selected in consultation with the faculty members in charge of the course.

Molecular, Cellular, and Developmental Biology (MCDB)

* **MCDB 040b, 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. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. SC

* **MCDB 050a, Immunity and Microbes** Paula Kavathas

Introduction to the immune system and its interaction with 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 diseases such as polio and AIDS. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. SC

* **MCDB 065a, 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. Preregistration required; see under First-Year Seminar Program. SC

* **MCDB 103b, Cancer** Alexia Belperron

Introduction to the biology of cancer, with a focus on leukemia, skin cancer, and cancers linked to infection. Topics include genetics, biochemistry, immunity, infection agents,

and challenges for prevention and treatment. Intended for non-science majors and upper-level students. High school biology required. SC

MCDB 105a or b / MB&B 105a or b, Biology, the World, and Us Staff

Biological concepts taught in context of current societal issues, such as emerging diseases, genetically modified organisms, green energy, and the human brain and its disorders. Emphasis on biological literacy to enable students to evaluate scientific arguments. SC

*** MCDB 106a / E&EB 106a / HLTH 155a, 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 freshmen and sophomores. Prerequisite: high school biology. SC

MCDB 109b, Immunity and Contagion Paula Kavathas

This interdisciplinary course is for students that want to learn both 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. Other topics include the human microbiome, cancer immunotherapy and vaccines. Artwork and relevant history are included. SC

*** MCDB 175Lb, Exploring the Microbial World** Iain Dawson

This course is designed to provide an immersive, introductory biology lab for first years and sophomores. Students conduct semester long projects to develop methods and tools to study the growth patterns of an unusual filamentous bacteria, *Bacillus mycoides*. Biol 101-104 is a co- or-prerequisite. Restricted to first year and sophomore students. Preference given to students with no prior research experience. Instructor permission required. SC ½ Course cr

MCDB 200b, Molecular Biology Anna Marie Pyle and Farren Isaacs

A study of the fundamental principles of molecular biology, including the experimental methodologies used in biological research. 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, transcriptional and translational regulation, microRNAs and other noncoding RNAs, RNA processing, systems biology, and synthetic biology. Designed to provide an accelerated venue for MCDB majors and other students seeking to understand the molecular basis for gene expression and the resultant implications for medicine and biological engineering. Prerequisites: CHEM 161, 165, or 167 (or CHEM 112, 114, or 118), and BIOL 101 or permission of instructor. SC

MCDB 201b, 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. *For freshmen and sophomores. Concurrently with or after MCDB 120a or 200b. Special registration procedures apply.* Students must contact the instructor prior to the first week of classes. MCDB 120a is a prerequisite for MCDB courses numbered 200 and above. SC ½ Course cr

*** MCDB 202a, Genetics** Stephen Dellaporta and Josh Gendron

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 RP

*** MCDB 203La, Laboratory for Genetics** Iain Dawson

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 ½ Course cr

MCDB 205b, Cell Biology Thomas Pollard, Megan King, Shirin Bahmanyar, and David Breslow

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

MCDB 210a or b, Developmental Biology Scott Holley, Douglas Kankel, 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. Prerequisites: BIOL 101, 102, and 103, or equivalent performance on the corresponding biological sciences placement examinations. SC

MCDB 221La, Laboratory for Foundations of Biology Maria Moreno

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 ½ Course cr

MCDB 250b, Biology of Reproduction Hugh Taylor

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

MCDB 251Lb, Laboratory for Biology of Reproduction and Development Hugh Taylor and Shannon Whirledge

Laboratory focus on aspects of human reproductive biology and connections with normal reproductive outcomes. Clinically relevant consideration of human tissue and cell models to study ovarian, uterine, and placental structure and function. Testing of the role of tissue specific cellular differentiation; human trophoblast function; and the roles of steroid hormones in the regulation of uterine, placental, and ovarian function. Mouse tissue models will be employed. Enrollment limited. Concurrently with or after MCDB 210 or 250. Not open to first-year students. Special registration procedures apply; students must consult the instructor prior to the first week of classes. SC ½ Course cr

MCDB 290b, Microbiology Stavroula Hatzios and Jing Yan

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 291Lb, Laboratory for Microbiology** Francine Carland

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 300a or b / MB&B 200a or b, Biochemistry** Ronald Breaker and 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. Prerequisites: BIOL 101 or equivalent performance on the corresponding biological sciences placement examination; one term of organic chemistry; or with permission of instructor. SC

*** MCDB 301Lb / MB&B 251La or b, Laboratory for Biochemistry** Andrew Miranker

An introduction to current experimental methods in molecular biology, biophysics, and biochemistry. Limited enrollment. Requires preregistration by e-mail to aruna.pawashe@yale.edu prior to the first week of classes. Prerequisite: BIOL 101. SC ½ Course cr

* **MCDB 303Lb, Advanced Molecular Biology Laboratory** Maria Moreno and F
Kenneth Nelson

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 310a / BENG 350a, Physiological Systems** W. Mark Saltzman and Stuart
Campbell

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

MCDB 315b, Pathobiology David Hudnall, Jon Morrow, Anita Huttner, Jeffrey Sklar,
and Gilbert Moeckel

Mechanisms of human disease from a pathologic perspective. Includes sections devoted to systemic pathobiology, hematologic disease, gastrointestinal disease, renal disease, and cancer genetics. Subjects covered include cell and tissue injury, disordered physiology, inflammatory disease, and neoplastic disease. Enrollment limited; preference to junior and senior majors in MCDB or MB&B. Prerequisites: MCDB 205, 300, or 310 SC RP

MCDB 320a / NSCI 320a, Neurobiology Haig Keshishian and Paul Forscher
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. Prerequisites: year of college-level chemistry; a course in physics is strongly recommended. SC

MCDB 321La / NSCI 321La, Laboratory for Neurobiology Haig Keshishian and Paul
Forscher

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 325a, Molecular Hallmarks of Cancer Nadya Dimitrova

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 courses (BIOL101-104) and two MCDB200-level courses (selected from MCDB200, MCDB202, MCDB205, and MCDB210) or instructor permission.

MCDB 329a / NSCI 329a, Sensory Neuroscience and Illusions Damon Clark
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 330a / BENG 230a / MB&B 330a / NSCI 324a, 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

* **MCDB 342La, Laboratory in Nucleic Acids I** F Kenneth Nelson
A project from a research laboratory within the MCDB department, using technologies from molecular and cell biology. Laboratories meet twice a week for the first half of 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 ½ Course cr

* **MCDB 343La, Laboratory in Nucleic Acids II** F Kenneth Nelson
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 ½ Course cr

* **MCDB 344Lb, Experimental Techniques in Cellular Biology** F Kenneth Nelson
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 345Lb, Experimental Strategies in Cellular Biology** F Kenneth Nelson
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 350a, Epigenetics** Josien van Wolfswinkel, Nadya Dimitrova, 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

* **MCDB 355a, 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 361b / BENG 465b / MB&B 361b / NSCI 325b, Modeling Biological Systems II
Joe Howard, Damon Clark, and Thierry Emonet

Advanced topics related to dynamical processes in biological systems. Processes by which cells compute, count, tell time, oscillate, and generate spatial patterns. Time-dependent dynamics in regulatory, signal-transduction, and neuronal networks; fluctuations, growth, and form. Comparisons between models and experimental data. Dynamical models applied to neurons, neural systems, and cellular biophysical processes. Use of MATLAB to create models. Prerequisite: MCDB 330 or equivalent, or a 200-level biology course, or with permission of instructor. QR

* **MCDB 364a / MB&B 364a, Light Microscopy: Techniques and Image Analysis**
Joseph Wolenski and Scott Holley

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 370b, Biotechnology** Craig Crews, Ronald Breaker, Joseph Wolenski, F Kenneth Nelson, Farren Isaacs, and Yannick Jacob

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

* **MCDB 375b, Human Biology: Research Methods, Questions, and Societal impact** Valerie Horsley and 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 380a, Advances in Plant Molecular Biology** Yannick Jacob, Vivian Irish, and Josh Gendron

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 387a, The Eukaryotic Cell Cycle** Iain Dawson

The regulation and coordination of the eukaryotic cell cycle examined by means of a detailed critique of primary literature. Particular attention to the role of the cell cycle in the processes of development and differentiation and in cancer and other diseases. Students develop an understanding of experimental approaches to problem solving. Enrollment limited, with preference to juniors and seniors. Prerequisites: BIOL 101, 102, and 103, or equivalent performance on the corresponding biological sciences placement examinations; MCDB 202, 205, or 210. Electronic permission key required. Students must contact the instructor prior to the first class meeting. SC

* **MCDB 415b, 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 430a, Biology of the Immune System** Eric Meffre, David Schatz, Peter Cresswell, Jordan Pober, Joao Pereira, Ruslan Medzhitov, Craig Roy, Nikhil Joshi, Aaron Ring, Noah Palm, Kevan Herold, Carla Rothlin, and Carrie Lucas
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

* **MCDB 450b, 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 452b / MB&B 452b / S&DS 352b, 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

* **MCDB 470a or b, Tutorial in Molecular, Cellular, and Developmental Biology** Valerie Horsley
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, which is available at <http://mcd.b.yale.edu/forms> as well as on the course site on Classes*v2, and a written plan of study with bibliography, approved by the faculty research adviser. The form and proposal must be uploaded to Classes*v2 by the end of the second week of classes. 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 if taken in the senior year.

* **MCDB 471a or b, Senior Seminar in Biology** Valerie Horsley
This course instructs students in developing effective writing and speaking skills required for preparation of scientific manuscripts and presentations, and communicating in the scientific world. Students will be required to prepare and present

oral presentations and to submit a literature review and written grant proposal by the end of the semester. SC

* **MCDB 474a or b, Independent Research** Joseph Wolenski, Jing Yan, and Michael O'Donnell

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 at <http://mcd.b.yale.edu/forms> as well as on 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 475a or b, Senior Independent Research** Joseph Wolenski, Jing Yan, and Michael O'Donnell

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 at <http://mcd.b.yale.edu/forms> as well as on 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 482a, 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 485a or b and MCDB 486a or b, Senior Research** Joseph Wolenski, Jing Yan, and Michael O'Donnell

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 at <http://>

mcdb.yale.edu/forms and 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 495a or b and MCDB 496a or b, Senior Research Intensive** Joseph Wolenski, Jing Yan, and Michael O'Donnell

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 at <http://mcdb.yale.edu/forms> and 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 with an intensive major. 2 Course cr per term

Music (MUSI)

* **MUSI 035b / CPSC 035b, 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. Preregistration required; see under First-Year Seminar Program. QR

* **MUSI 081b / ER&M 081b / SOCY 081b, 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. Pre-registration required: see under First Year Seminar Program. SO

MUSI 110a or b, Elements of Musical Pitch and Tone Ian Quinn

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.

MUSI 131b, Introduction to the History of Western Music: 1800 to the Present

Gundula Kreuzer

A survey of musical practices, institutions, genres, styles, and composers in Europe and North America from 1800 to the present. No prerequisites. Knowledge of Western musical notation is highly beneficial. HU

*** MUSI 137a, 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 175b, Listening to Music Brian Kane

Development of aural skills that lead to an understanding of Western music. The musical novice is introduced to the ways in which music is put together and is taught how to listen to a wide variety of musical styles, from Bach and Mozart, to Gregorian chant, to the blues. HU

*** MUSI 185a / THST 236a, 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 207a or b, Commercial and Popular Music Theory** Nathaniel Adam

An introduction to music-theory analysis of commercial and popular song (with a focus on American and British music of the past 50 years, across multiple genres). Coursework involves study of harmony, voice leading and text setting, rhythm and meter, and form, with assigned reading, listening, musical transcription and arranging, and written/oral presentation of analysis. Prerequisite: Completion of a 100- or 200-level music theory course or the corresponding placement exam, and/or permission of instructor. HU

*** MUSI 210a or b, Counterpoint, Harmony, and Form: 1500-1800** Staff

A concentrated investigation of basic principles and techniques of period musical composition through study of strict polyphonic voice leading, figuration, harmonic progression, phrase rhythm, and small musical forms. Recommended to be taken concurrently with MUSI 217. See the *Calendar for the Opening Days* or the Music department website for information about the placement test. HU

MUSI 211b, Systematic Theory for Music: 1800 to the present Staff

Continuation of MUSI 210's study of western art music, focusing on techniques developed 1800 to the present. Introduction to formal models of musical analysis and composition. Prerequisite: MUSI 207, 210, 217, 218, or equivalent. HU

*** MUSI 216a or b, Meter, Rhythm, Musical Time** Staff

How do the mind and body make sense of patterned sounds in time? How do musical cultures, and individual musicians, create sonic time-patterns that engage attention, stir emotions, and inspire collective behavior? How well does standard Western notation represent these patterns and responses? What other systems of representation are available for exploring the properties of individual songs or compositions? The course focuses on meter, durational rhythm, their interaction across short and long spans of musical time, and their capacity to shape musical form. Repertoires are drawn from various historical eras of notated European music; contemporary popular, jazz, and electronic dance music; and contemporary and traditional musics of Africa, Asia, and the Caribbean. Students acquire a deeper understanding of a fundamental human capacity, as well as specific tools and habits that can be put to use in various activities as performers, composers, improvisers, listeners, and dancers. Prerequisite: Ability to read standard musical notation. HU

*** MUSI 217a or b, Keyboard Skills for Tonal Music** Staff

This course teaches music-theory keyboard skills such as score reading, melody harmonization, figured-bass realization, and improvisation, and how these topics connect to written music-theory analysis and composition. Prerequisite: Completion of a 100- or 200-level music theory course, intermediate keyboard ability*, and permission of instructor. *eg: 2-octave scales in major and minor keys through 4 sharps/flats; sightread simple hymns/chorales at beat=60; knowledge of roman numerals HU

*** MUSI 218a or b, Aural Skills for Tonal Music** Nathaniel Adam

Tonal music theory topics with an emphasis on sight-sightreading, rhythm, melodic and harmonic dictation, and aural analysis. Prerequisite: Completion of MUSI 110, or any 200-level MUSI course, or the following: ability to match pitch and sing a major scale; knowledge of standard staff notation (treble/bass clefs); knowledge of major/minor key signatures; knowledge of basic time signatures; knowledge of intervals; knowledge of triads. HU RP

*** MUSI 220a and MUSI 221b, The Performance of Chamber Music** Wendy Sharp

Coached chamber music emphasizing the development of ensemble skills, familiarization with the repertoire, 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 per term

*** MUSI 228a / THST 224a, Musical Theater Performance I** Maria-Christina Oliveras

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.

Auditions/interviews will be scheduled during the first two weeks of August. May be repeated for credit. For audition information contact dan.egan@yale.edu. HU RP

*** MUSI 229b / THST 226b, Musical Theater Performance II** Staff

The collaborative process and its effect on musical theater performance. Choreography, music direction, and origination of new works. Analysis of texts, scripts, and taped or filmed performances; applications in students' own performance. May be repeated for credit. For audition information e-mail dan.egan@yale.edu. RP

*** MUSI 230a, Composing for Musical Theater** Joshua Rosenblum

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: MUSI 110 or equivalent. Enrollment limited to 12. Please contact joshua.rosenblum@yale.edu with any questions about eligibility. HU RP

*** MUSI 231b, Laptop Ensemble: Study and Performance** Konrad Kaczmarek

Investigations into music technology through a combination of classroom learning and live performance. The appropriation of music technology through software and hardware hacking; laptop-based production and performance tools; hybrid electroacoustic instruments and electronic chamber music; live audio processing; novel approaches to notation and conducting. Students create new works and perform in a concert at the end of the term. RP

*** MUSI 232a or b, Central Javanese Gamelan Ensemble** Staff

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 240a or b, 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 318a, Intermediate Musicianship** Richard Lalli

Training in advanced aural perception, sight-singing, and keyboard skills. Prerequisite: MUSI 219 or equivalent.

*** MUSI 320a, Composition Seminar I** Kathryn Alexander

Intermediate analytic and creative projects in music composition, instrumentation, and scoring for visual media. Study of compositional procedures and techniques in different genres and styles. Group and individual lessons to supplement in-class activities. Enrollment limited to 20. Students with questions should contact the instructor at

kathryn.alexander@yale.edu. Previously MUSI 312. Prerequisite: MUSI 210 or 211 or equivalent. HU RP

* **MUSI 321b, Composition Seminar II** Konrad Kaczmarek

Intermediate analytic and creative projects in music composition and instrumentation, with a focus on jazz harmony, voice-leading, and music production tools. Study of compositional procedures and techniques in different ensemble settings. Group and individual lessons to supplement in-class lectures. Enrollment limited to 20. Students with questions should contact the instructor at konrad.kaczmarek@yale.edu. Prerequisite: MUSI 210 or MUSI 211 and/or MUSI 312. RP

* **MUSI 327a, Black American Art Song** Richard Lalli

This course is geared to both singers and pianists. It explores the lives and times of numerous composers#male and female#and also provides an introduction to issues of performance practice, singing technique, and pronunciation. The primary goal is to understand how the vocal execution of text can be informed by a study of historical events, social contexts, and aesthetic currents. The importance of text, breathing and communication are central to the performative component of the seminar. Prerequisites: Music reading ability and previous solo performing experience. RP

* **MUSI 328a, Introduction to Conducting** William Boughton

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 329b, Intermediate Conducting** William Boughton

Intermediate studies in baton technique and score preparation. After MUSI 323.

* **MUSI 330b, Musical Theater Composition II** Staff

Intermediate and advanced project-oriented studies in composition of musical theater. Prerequisite: MUSI 210. May be repeated for credit. Enrollment limited to 12. HU RP

* **MUSI 340b / THST 318b, Analyzing, Directing, and Performing Early Opera** Grant Herreid

Study of a seventeenth-century Venetian opera, with attention to structural analysis of text and music. Exploration of period performance practice, including rhetorical expression, musical style, gesture, dance, Italian elocution, and visual design. Production of the opera in conjunction with the Yale Baroque Opera Project. Open to all students, but designed especially for singers, instrumentalists, and directors. Admission by audition only. May be repeated for credit. For audition information e-mail grant.herreid@yale.edu. HU RP

* **MUSI 345a or b, 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 350a, History of Western Music: Middle Ages and Renaissance** Anna Zayaruznaya

A detailed investigation of the history of musical style from A.D. 900 to 1600. Preference to Music majors according to class. HU

* **MUSI 381a / AFAM 253a, Jazz in Transition, 1960–2000** Michael Veal

A survey of musicians, stylistic currents, and critical issues relevant to the evolution of jazz between 1960 and 2000. Topics include Third Stream, free jazz, jazz-rock fusion, the influence of world music, neo-classicism, jazz and hip-hop, and others. HU

* **MUSI 401a / THST 417a, Approaches to Dance and Music Relationships** Ming Wai Tai

The twentieth-century saw new and exciting ways for dance to relate to music. Some choreographers collaborated with composers in experimental ways, while others choreographed to existing non-dance music, and so on. These new artistic possibilities led to novel critical and philosophical questions concerning the relationship of music and dance. This course begins with a survey of dance-music relationships from the twentieth-century to the present, highlighting noteworthy collaborations between choreographers and composers. We then examine the perspectives of other dance writers, such as dancers, dance teachers, accompanists, critics, philosophers, and choreomusicologists, and discuss how they relate to, inform, or differ from one another and from choreographers and composers. We also discuss the broader social and intellectual environment in which these artworks and writings were produced (e.g. feminism, challenges to the work-concept in music, etc). HU

* **MUSI 402a, Tonal Counterpoint: Analysis and Composition** Malcolm Sailor

Advanced studies in the theory, analysis, and composition of the music of the early and mid-eighteenth century. Previously MUSI 302. Prerequisite: MUSI 210. Enrollment limited to 18. Preference to Music majors according to class. HU

MUSI 409a, Musical Spaces, Sets, and Geometries Richard Cohn

Conception and representation of pitch and rhythm systems using set, group, and graph theory. Focus on European concert music of the late nineteenth and twentieth centuries. Prerequisite: MUSI 211. Enrollment limited to 18. Preference to Music majors according to class. QR

* **MUSI 418b, Advanced Musicianship** Richard Lalli

Development of students' ability to recognize and generate structures and processes particular to music of the twentieth century. Student composers and advanced performers of post-tonal music expand their perceptive skills. Course activities include singing (and playing), dictation, identification, improvisation, and recognition. Musical examples from the works of Schoenberg, Bartók, Debussy, and Stravinsky. Enrollment limited to 14.

* **MUSI 420a, 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 420 audition assignment page at the Canvas site.

Students with questions should contact the instructor at konrad.kaczmarek@yale.edu.

Prerequisites: Both MUSI 320 and 321. RP

*** MUSI 421b, Composition Seminar IV** Kathryn Alexander

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 the first Friday of the semester to the designated Music 421 audition assignment page at the Canvas site. Students with questions should contact the instructor at kathryn.alexander@yale.edu. Prerequisites: Both MUSI 320 and 321. RP

*** MUSI 425a, Electronic Instrument Design** Konrad Kaczmarek

Live audio and video processing using the visual programming environment Max/MSP/Jitter. Topics include human computer interaction (HCI), instrument design, alternative controllers, data mapping, algorithmic composition, real-time digital signal processing, communication over the network, and programming for mobile devices.

HU RP

MUSI 427b / CPSC 432b, 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 428a / CPSC 431a, 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 445a or b, 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 449a or b, 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 452b / EDST 478b, Music, Service, and Society** Sebastian Ruth

The role of musicians in public life, both on and off the concert stage. New ways in which institutions of music can participate in the formation of civil society and vibrant communities. The potential influence of music on the lives of people experiencing political or social oppression. HU RP

* **MUSI 459b, 19th-Century Opera and Representation** Gundula Kreuzer

Throughout the long nineteenth century, opera was the most expensive, lavish, and politically implicated multimedia spectacle, with both its production and the act of opera-going offering prime opportunities to negotiate personal and collective identities. By looking at all of opera's complex media – libretti, music, voice types, design, stage technology, architecture, etc. – this seminar addresses various forms and techniques of representation related to such issues as gender, sexuality, class, race, nationalism, (dis)ability, the rise of the masses as a political agent, and the operatic genre itself as a vehicle of colonialism. Each week focuses on one topic and opera (or scenes), including works by Rossini, Weber, Meyerbeer, Verdi, Wagner, Puccini, Smyth, and Gershwin, as well as their representation on today's stages. A visit to the Metropolitan Opera is anticipated (if possible). Familiarity with Western musical notation is suggested. HU

* **MUSI 461a, Women and Western Art Music** Gundula Kreuzer

An exploration of the representation of, involvement in, and discourse around women in (and around) Western art music. Guiding concerns are the cultural, ideological, socio-political, discursive, and biographical contexts conditioning the activities of female-identifying composers, performers, patrons, and critics over the past four centuries. Individual classes address musical and biographical case studies; challenges of the archive; the representation of women in operas and their contemporary productions; processes and agents of (de)canonization; the rise of the diva; intersections of race, class, gender, and sexual orientation in stereotyping the female musician; and recent writing in feminist and queer musicology more broadly. Prerequisite: familiarity with Western musical notation. HU

* **MUSI 462b / ENGL 205b / HUMS 200b / LITR 195b, 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 480a / AFAM 479a, 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 481b, Electronic Dance Music** Kathryn Alexander

Survey of creative techniques used in electronic dance music, such as digital sampling, synthesis, MIDI sequencing, DSP, and mixing. Focus on evolving EDM genres and repertoire. Prerequisite: MUSI 110 or 200 level music theory course or equivalent. HU
RP

* **MUSI 495a or b, Individual Study** Anna 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 496a or b, The Senior Recital** Anna 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 497a or b, The Senior Project in Composition** Anna Zayaruznaya

Preparation of a senior composition project under faculty supervision. Admission by permission of the composition faculty of the Department of Music. Prerequisites: MUSI 312, 313, 412, and 413.

* **MUSI 498a or b, The Senior Project in Musical Theater Composition** Anna 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 499a or b, The Senior Essay** Anna Zayaruznaya

Preparation of a senior essay under faculty supervision. Admission by permission of the director of undergraduate studies.

Naval Science (NAVY)

Near Eastern Languages and Civilizations (NELC)

* **NELC 005a / HUMS 005a, The Ancient Egyptian Empire of the New Kingdom**
Nadine Moeller

For most of the duration of the New Kingdom (1550-1069 BCE), the ancient Egyptians were able to establish a vast empire and became one of the key powers within the Near East. This course is an introduction to the history, archaeology and literary sources of one of the most dynamic periods of ancient Egyptian history. We investigate the development of Egyptian foreign policies and military expansion, which affected parts of the Near East and Nubia to the south. We also examine and discuss topics such as ideology, imperial identity, political struggle and motivation for conquest and control of wider regions surrounding the Egyptian state as well as the relationship to other powers and their perspective on Egyptian rulers, as, for example, described in the famous Amarna letters, the world's earliest diplomatic correspondence. Throughout

the semester, we consider the different sources that have survived in the archaeological and textual record for understanding Egypt's first empire within its ancient geopolitical context. All primary texts are read in translation. HU

* NELC 026a / ARCG 031a / EVST 030a, **Origins of Civilization: Egypt and**

Mesopotamia Harvey Weiss

The origins of the earliest civilizations in Mesopotamia and Egypt along the Nile and Tigris-Euphrates Rivers explored with archaeological, historical and environmental data for the origins of agriculture, the classes and hierarchies that marked earliest cities, states and empires, the innovative monumental architecture, writing, imperial expansion, and new national ideologies. How and why these civilizational processes occurred with the momentous societal collapses at periods of abrupt climate change. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU, SO

NELC 102b / HIST 381b / MMES 102b / SOCY 102b, **Introduction to the Middle East**

Jonathan Wyrzten

Introduction to the history, politics, societies, and cultures of the Middle East. Topics and themes include geopolitics, environment, state formation, roles of Judaism/Christianity/Islam, empire&colonialism, nationalism, regional & global wars, Palestine-Israel conflict, US and other Great Power intervention. HU, SO

NELC 112b / AFST 112b / ARCG 222b / RLST 141b, **Egyptian Religion through the**

Ages John Darnell

Diachronic approach to topics in Egyptian religion. Religious architecture, evidence for protodynastic cults, foreigners in Egyptian religious celebrations, music and vocal expression in Egyptian religion, Re and Osiris, the Amarna interlude and the Ramesside solar religion, and the goddess of the eye of the sun. Readings in translation. HU

NELC 115b, **The Bible in Its Ancient Near Eastern Setting** Eckart Frahm

History of the Assyrian, Babylonian, and Persian empires of the first millennium B.C.E.; how their rise and fall influenced the politics, religion, and literary traditions of biblical Israel. Topics include the role of prophecy and (divine) law, political and religious justifications of violence, the birth of monotheism, and the historical reliability of the Hebrew Bible. HU

* NELC 128a / HUMS 128a, **From Gilgamesh to Persepolis: Introduction to Near**

Eastern Literatures Kathryn Slanski

This lecture 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. WR, HU

* **NELC 169a / MMES 179a / PERS 180a, Reading Persian Texts** Farkhondeh Shayesteh

Students are presented with opportunities to enhance their knowledge of Persian, with primary focus on reading skills. The course involves reading, analyzing, and in-class discussion of assigned materials in the target language. Authentic reading excerpts from history, art, philosophy, and literature, as well as art history materials from medieval to modern times are used. This course is taught in Persian. Prerequisite: L4 and instructor permission. L5

NELC 201b / ENGL 191b / HUMS 206b / LITR 318b / MMES 215b, The Arabian Nights, Then and Now Robyn Creswell

Exploration of *Arabian Nights*, a classic of world literature. Topics include antecedents, themes and later prose, and graphic and film adaptations. HU

* **NELC 237b / ARBC 171b / ARBC 527b / LITR 267b / MMES 177b / NELC 598b, Hunger in Eden: Mohamed Choukri's Narratives** Jonas Elbousty

A survey of the work of Mohamed Choukri, one of the most prominent Moroccan, if not Arab, writers to have shaped the modern Arabic literary canon. His influence has been instrumental in forming a generation of writers and enthusiastic readers, who fervently cherish his narratives. Students dive deeply into Choukri's narratives, analyzing them with an eye toward their cultural and political importance. The class looks to Choukri's amazing life story to reveal the roots of his passion for writing and explores the culture of the time and places about which he writes. Through his narratives, students better understand the political environment within which they were composed and the importance of Choukri's work to today's reader regarding current debates over Arab identity. This class surveys the entirety of his work, contextualizing within the sphere of Arabic novelistic tradition. Prerequisite: ARBC 151, L4 or equivalent, or permission from the of instructor. L5

* **NELC 243a / ARCG 245a, Archaeology of Ancient Egypt: An Introduction** Gregory Marouard

This seminar is an introductory class that examines in detail the archaeology of ancient Egypt following the chronological order of Egyptian history and covering almost 4000 years, from the late Neolithic period to the end of the Greco-Roman period. The aim is not only to give a comprehensive overview of major sites and discoveries but also to use as much as possible information from recent excavations, discuss problems and priorities concerning this field, offer an introduction to new fieldwork methods and approaches used in Egypt as well as a short history of this discipline. HU

* **NELC 245a / ARCG 246a, Era of the Pyramids: Archaeology and Material Culture of the Old Kingdom, Egypt** Gregory Marouard

This seminar examines in detail the Old Kingdom period, covering about 800 years of this crucial phase of the Egyptian civilization, starting with the late phase of the Early Dynastic state formation period (ca. 2850 BCE) to the First Intermediate period (ca. 2050 BCE), encompassing the 3rd to the 6th Dynasties. All major archaeological sites of this period are investigated through the scope of material culture, art and architecture, using as much as possible information from recent excavations and discoveries in this specific field. This approach includes the study of the large mortuary complexes, from Saqqara to Dahschur, Giza Abu Rawash and Abusir, as well several settlement sites from the central state capital in the Memphite region, the lower and upper provinces to the Egyptian borders. Several aspects of the connections established by Egypt with

its neighboring areas such as Nubia and the Levant and deserted areas at the periphery of the Nile Valley are included to illustrate the extensive exchange network and the complex economy and administrative system established in order to support the major construction projects engaged during this period. Material culture, artistic aspects and typologies (within an overview of reliefs and statuary), craft productions, everyday life activities and burial practices are addressed. This course constitutes the first step of a series of chronological survey courses in Egyptian Archaeology. HU

NELC 311a / CLCV 219a / HIST 311a, Egypt of the Pharaohs Joseph Manning and Nadine Moeller

Egypt was among the first centralized territorial states in the world, and, because Egyptian history offers us 4000 years of institutional development and change, the focus of this course is on the long-term development of the ancient Egyptian state, its institutions, and its culture. The course introduces students to the history and culture of ancient Egypt from the rise of the central state to the early Christian period. General historical trends, the relationship of Egyptian history to other contemporary ancient cultures, and the legacy of Egypt to the “West” are also considered. At the end of the course, students have an understanding of the material culture and the historical development of ancient Egypt, and an appreciation for the relationship of the ancient sources to the construction of ancient Egyptian history. HU

*** NELC 390b / EVST 351b, The Anthropocene** Harvey Weiss

“The Anthropocene” is the recent and informal designation for the period during which human activity has transformed the Earth. The Anthropocene is now the subject of intense research and debate among environmental historians, archaeologists, botanists, and climate system modelers. The reasons for this are clear: we need to know the history of the Earth’s transformation(s) in order to understand present rates of atmospheric, climatic, environmental, demographic, land use, and biodiversity change. What were the magnitudes and rates of these changes, individually or synchronously, over the past 10,000 years? 4000 years? 100 years? Are these rates of change “normal,” unusual, benign, unimportant, or “dangerous?” SO

NELC 402b / MMES 171b, The Islamic Near East from Muhammad to the Mongol Invasion Kevin van Bladel

The shaping of society and polity from the rise of Islam to the Mongol conquest of Baghdad in 1258. The origins of Islamic society; conquests and social and political assimilation under the Umayyads and Abbasids; the changing nature of political legitimacy and sovereignty under the caliphate; provincial decentralization and new sources of social and religious power. HU

*** NELC 453a / ARBC 450a / LING 327a, 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 140 and permission of instructor.

*** NELC 473a / ANTH 473a / ARCG 473a / EVST 473a, Climate Change, Societal Collapse, and Resilience** Harvey Weiss

The coincidence of societal collapses throughout history with decadal and century-scale abrupt climate change events. Challenges to anthropological and historical paradigms

of cultural adaptation and resilience. Examination of archaeological and historical records and high-resolution sets of paleoclimate proxies. HU, SO

*** NELC 490a / MMES 490a / RLST 445a, Introduction to Arabic and Islamic Studies**

Frank Griffel

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.

*** NELC 492a and NELC 493b, The Senior Essay** Staff

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 493) 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 314 HGS, 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 160b / PSYC 160b, The Human Brain Gregory McCarthy

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 161b / PSYC 161b, Drugs, Brain, and Behavior Hedy Kober

An introduction to psychoactive drugs and their effects on both brain and behavior. Review of pharmacological and brain mechanisms of different classes of legal, illegal, and medicinal drugs, including alcohol, caffeine, tobacco, stimulants, depressants, antidepressants, and hallucinogens. Individual drugs' pharmacokinetics, mechanisms of action, dosing, routes of administration, and patterns and effects of use and misuse. Some attention to substance use disorders/addictions, prevention, and treatment. SC

* **NSCI 258b / PSYC 258b, Computational Methods in Human Neuroscience** Nick Turk-Browne

This course provides training on how to use computational science for the advanced analysis of brain imaging data, primarily from functional magnetic resonance imaging (fMRI). Topics include scientific programming, high-performance computing, machine learning, network/graph analysis, real-time neurofeedback, nonparametric statistics, and functional alignment. Prerequisites: CPSC 100, CPSC 112 or other course involving terminal commands and programming (Python preferred); course in statistics and/or data science; PSYC 160 or other human neuroscience course; or permission of instructor. QR, SC

* **NSCI 270a / PSYC 270a, 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 320a / MCDB 320a, Neurobiology Haig Keshishian and Paul Forscher

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. Prerequisites: year of college-level chemistry; a course in physics is strongly recommended. SC

NSCI 321La / MCDB 321La, Laboratory for Neurobiology Haig Keshishian and Paul Forscher

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 324a / BENG 230a / MB&B 330a / MCDB 330a, 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

NSCI 325b / BENG 465b / MB&B 361b / MCDB 361b, Modeling Biological Systems II

Thierry Emonet, Joe Howard, and Damon Clark

Advanced topics related to dynamical processes in biological systems. Processes by which cells compute, count, tell time, oscillate, and generate spatial patterns. Time-dependent dynamics in regulatory, signal-transduction, and neuronal networks; fluctuations, growth, and form. Comparisons between models and experimental data. Dynamical models applied to neurons, neural systems, and cellular biophysical processes. Use of MATLAB to create models. Prerequisite: MCDB 330 or equivalent, or a 200-level biology course, or with permission of instructor. QR

NSCI 329a / MCDB 329a, Sensory Neuroscience and Illusions Damon Clark

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 340b / PSYC 335b, 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 341b / PSYC 376b, Learning and Memory Samuel McDougale

The basic facts, general principles, and theories that describe how higher animals, from mice to humans, are changed by their experiences. The historically separate fields of learning and memory research desegregated under a neuroscientific perspective that recognizes the evolutionary continuity among higher animals. Prerequisite: Introductory courses in biology and psychology, or permission of instructor. SC, SO

NSCI 352a / CGSC 352a / PSYC 352a, Arrested or Adaptive Development of the Adolescent Brain BJ Casey

Study of empirical and theoretical accounts of adolescent-specific changes in the brain and in behavior that relate to the development of self control. Discussions will focus on adaptive and arrested adolescent brain development in the context of relevant legal, social, and health policy issues. Prerequisites: PSYC 110, PSYC 160. SC

NSCI 360b / PSYC 316b, Clinical Neuroscience Tyrone Cannon

The biological bases of psychopathology, with attention to the interplay of biological and psychological factors. Research and theory regarding the role of biological influences such as genetics, neuronal physiology and signaling, and psychopharmacology in the major classes of mental disorders. Discussion of mood and

anxiety disorders, schizophrenia, addictions, personality disorders, eating disorders, and autism. SC

*** NSCI 419b / CGSC 419b / PSYC 419b, Topics in Brain Development, Law, and Policy** BJ Casey

Healthy development is a fundamental right of the individual, regardless of race, ethnicity, socioeconomic status, or gender. Youth require special protections of their rights due to vulnerabilities related to their physical and mental immaturity. These rights include, not only protections, but opportunities for building the cognitive, emotional, and social skills necessary for becoming a healthy adult and a contributing member of society. This seminar examines the extent to which legal policies and practices in the treatment of youths are consistent with scientific knowledge on psychological and brain development. Each class discusses one or more legal cases highlighted in the context of brain and psychological science and current laws and policies. Prerequisite: PSYC 110 and PSYC 160 preferred. SO

*** NSCI 440b / CGSC 420b / PSYC 420b, Topics in Clinical Neuroscience** Avram Holmes

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 441a / PSYC 438a, Computational Models of Human Behavior** Robb Rutledge

Why do we do the things we do? How do we adapt to changes in the environment? And how does our happiness depend on our choices and what happens to us? How can computational models help us to gain new insights into psychological processes? The goal of this course is to use computational models to understand human behavior and its relationship to our emotions. Data is collected in a variety of tasks including new experiments designed by students, and is analyzed using computational models. CPSC 112 or other course involving programming (e.g., C++, Java, Python, Matlab), or permission of instructor. SC

*** NSCI 442a / PSYC 428a, Neuroscience of Decision-Making** Molly Crockett

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 449a / PSYC 449a, 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 453a / CPSC 453a, Unsupervised Learning for Big Data Smita Krishnaswamy

This course focuses on machine-learning methods well-suited to tackling problems associated with analyzing high-dimensional, high-throughput noisy data including: manifold learning, graph signal processing, nonlinear dimensionality reduction, clustering and information theory. Though the class goes over some biomedical applications, such methods can be applied in any field. Prerequisite: Knowledge of linear algebra and Python Programming.

*** NSCI 455b / PSYC 432b, Under Pressure: The Psychology of Stress** Dylan Gee

Stress is pervasive in everyday life. Why do humans experience stress, and what causes stress in today's society? How does stress affect the ways we think, feel, and behave? Why are some people particularly susceptible to the effects of stress on mental and physical health? What factors can buffer against the consequences of stress, and how can we leverage stress management techniques to effectively cope with stress? This course draws from psychological, neurobiological, social, developmental, and clinical perspectives to address these questions. In addition to an in-depth study of theory, research, and intervention in the field of stress, this seminar is designed to translate scientific advances to help students learn how to more effectively manage stress in their own lives. Priority given to juniors and 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 470a, Independent Research** Nick Turk-Browne and Damon Clark

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 479a / PSYC 479a, Computational Basis of Seeing and Thinking** Ilker Yildirim

The goal of this seminar is to discuss the computational basis of seeing and thinking in the mind and brain. We are especially concerned with this question of how perception gets us to cognition: How is it that perception transforms raw, unprocessed, unorganized, incoming sensory signals arising from our physical environments – for

example, the light that bounces off surfaces and arrives at your retina, raw audio waves hitting your ears, or the vibro-tactile sensations you feel at your fingertips when you touch a surface – into things like objects and people, into things that we can think about? We somewhat prioritize the field of scene perception, where many fundamental questions about the nature of seeing and aspects of cognition arise prominently, and much of those questions remain open to this date. We draw upon readings and classroom discussions to find out where the literature stands, including behavioral, neural, and computational studies, all in the context of searching for a mechanistic, functional account of how the brain produces percepts and thoughts about objects, scenes, and people. so

* **NSCI 480a, Senior Non-empirical Research** Nick Turk-Browne and Damon Clark 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 490a, Senior Empirical Research** Nick Turk-Browne and Damon Clark 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)

Persian (PERS)

PERS 110a, 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 120b, Elementary Persian II Farkhondeh Shayesteh

Continuation of PERS 110, with emphasis on all four language skills: reading, writing, listening, and speaking. Prerequisite: PERS 110 or permission of instructor. L2 RP
1½ Course cr

PERS 130a, Intermediate Persian I Farkhondeh Shayesteh

Continuation of PERS 120, with emphasis on expanding vocabulary and understanding more complex grammatical forms and syntax. Prerequisite: PERS 120 or permission of instructor. L3 RP 1½ Course cr

PERS 140b, Intermediate Persian II Farkhondeh Shayesteh

Continuation of PERS 130, with emphasis on expanding vocabulary and understanding more complex grammatical forms and syntax. Prerequisite: PERS 130 or permission of instructor. L4 RP 1½ Course cr

* **PERS 180a / MMES 179a / NELC 169a, Reading Persian Texts** Farkhondeh Shayesteh

Students are presented with opportunities to enhance their knowledge of Persian, with primary focus on reading skills. The course involves reading, analyzing, and in-class discussion of assigned materials in the target language. Authentic reading excerpts from history, art, philosophy, and literature, as well as art history materials from medieval to modern times are used. This course is taught in Persian. Prerequisite: L4 and instructor permission. L5

Philosophy (PHIL)

* **PHIL 088a, The Philosophy of Transformative Experience** Laurie Paul

Going to college, fighting in a war, having a baby, being spiritually reborn, betraying your lover, emigrating to a new country – all of these are experiences that can transform you. By transforming you, they change you, and in the process, they can restructure the nature and meaning of your life. Exploring the epistemic structure of transformation can help us to understand the special and distinctive ways that new experiences can form and change us, and how this relates to how we make life choices, both big and small. This course explores the philosophical concept of transformative experience, focusing on the many ways this concept fits with contemporary philosophical issues in epistemology and metaphysics. We also explore connections to current research in psychology, cognitive science, and behavioral economics on empathy, morality, choice, and the self, in conjunction with discussions of the way that many real world experiences can be transformative. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

* **PHIL 091a, Philosophy of Games** Mark Maxwell

In this class, we critically discuss a variety of puzzles that arise when thinking about games. Just what are games, anyway? And, how can thinking in terms of games help us understand the world? The notion of 'game' is a topic of interest in its own right, but games can also serve as a model and metaphor for other parts of the world, including life as a whole and the exploration of other philosophical debates. As such, the study of games serves as an entry point to a number of topics of potential interest, rather than just an in-depth study of one topic. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

PHIL 105b, Strong Men: Ties Between Patriarchy and Fascism Robin Dembroff and Jason Stanley

Fascist and patriarchal politics are intertwined. Why? In this course, we examine systems of gender inequality and far right nationalism from a philosophical perspective in order to more fully understand the intimate connections between them. HU

PHIL 115a, First-Order Logic Zoltan Szabo

An introduction to formal logic. Study of the formal deductive systems and semantics for both propositional and predicate logic. Some discussion of metatheory. QR

PHIL 125a / CLCV 125a, Introduction to Ancient Philosophy Brad Inwood

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

PHIL 126b, 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

PHIL 175b, 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

PHIL 176a, Death Shelly Kagan

There is one thing I can be sure of: I am going to die. But what am I to make of that fact? An examination of a number of issues that arise once we begin to reflect on our mortality. Consideration of the possibility that death may not actually be the end. Are we, in some sense, immortal? Would immortality be desirable? An attempt to get a clearer notion of what it is to die. And, finally, an evaluation of different attitudes to death. Is death an evil? Is suicide morally permissible? Is it rational? In short: how should the knowledge that I am going to die affect the way I live my life? Authors include Fischer, Perry, Plato, and Tolstoy. HU

PHIL 182b / CGSC 282b / PSYC 182b, Perspectives on Human Nature Joshua Knobe

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

PHIL 200a / CLCV 261a, Plato Staff

Focus on the central philosophical themes in the work of Plato and on methodology for studying Plato. Some prior philosophical study of Plato is recommended, such as PHIL/CLCV 125 or DRST 003. HU

PHIL 204b / GMAN 381b, Kant's Critique of Pure Reason Paul Franks

An examination of the metaphysical and epistemological doctrines of Kant's *Critique of Pure Reason*. Prerequisite: PHIL 126 or DRST 004. HU

* **PHIL 206a / RLST 210a, Nietzsche, Religion, History** Nancy Levene

An exploration of Nietzsche's concepts of religion and history and of his thinking in a broad historical arc up to the present. Course material includes texts by Nietzsche and selections from philosophies, theologies, and works of art that invite dialogue with his ideas. HU

PHIL 267a, 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 269a, The Philosophy of Science Daniel Greco

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 270a, Epistemology Keith DeRose

Introduction to current topics in the theory of knowledge. The analysis of knowledge, justified belief, rationality, certainty, and evidence. HU

PHIL 271a / LING 271a, Philosophy of Language Jason Stanley

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

PHIL 276a / PHIL 310, Metaphysics Robin Dembroff

Examination of some fundamental aspects of reality. Topics include time, persistence, modality, causation, and existence. HU

PHIL 280b / CGSC 275b / LING 275b, Pragmatics Laurence Horn

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 316b, Aristotle's Ethics and Its Neo-Aristotelian Revival David Charles

The aim of the lecture series is to examine Aristotle's ethical theory, its aims, assumptions and discussions of particular issues, and to compare it with recent attempts to revive aspects of his account as part of a distinctive virtue-based approach to ethics. The goal of the seminar is to answer the following questions: did Aristotle develop a distinctive account approach to ethical issues and, if so, how is it best understood? Is it best expressed in the terms suggested by contemporary virtue-based theorists who see their work as a reformulation of certain basic aspects of his account. In addressing the second question we consider the neo-Aristotelian accounts developed and criticised by Philippa Foot, Rosalind Hursthouse, Bernard Williams, Michael Thomson and Terrence Irwin (amongst others). The course is aimed at advanced undergraduates (seniors and juniors) in philosophy or classics. Priority

will be given to these students for enrollment if necessary. Knowledge of Greek is not required. HU

* **PHIL 344a / WGSS 348a, Feminist Ethics** Moya Mapps

In this course, we explore questions at the intersection of moral philosophy and feminist philosophy. Is there a distinctively feminine way to approach moral reasoning? If so, should we resist this feminine moral orientation as patriarchal, overly demanding, or otherwise oppressive? Or should we embrace it? This writing-intensive course is designed to strengthen writing skills. We also discuss meta-philosophical questions about the methods of mainstream moral philosophy, and about the analytic philosophy paper as a genre of writing. Prerequisite: At least one essay-based philosophy course. (Ideally in moral philosophy, feminist philosophy, or a related subject.) WR, HU

* **PHIL 361a / ENGL 248a / HSHM 476a / HUMS 430a / LITR 483a, Thought Experiments: Connecting Literature, Philosophy and the Natural Sciences** Paul Grimstad

The course looks closely at the intersection of literature, philosophy and natural science through the lens of the thought experiment. Do thought experiments yield new knowledge about the world? What role does narrative or scene setting play in thought experiments? Can works of literary fiction or films function as thought experiments? Readings take up topics such as personal identity, artificial intelligence, meaning and intentionality, free will, time travel, the riddle of induction, “trolley problems” in ethics and the hard problem of consciousness. Authors may include Mary Shelley, Plato, Albert Einstein, Franz Kafka, H.G. Wells, Rene Descartes, Kazuo Ishiguro, Rivka Galchen, Alan Turing, Hilary Putnam, as well as films (*The Imitation Game*) and television shows (*Black Mirror*). Students should have taken at least one course involving close analysis of works of literature or philosophy. WR, HU

* **PHIL 395a / CGSC 395a, Junior Colloquium in Cognitive Science** Staff

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 401a, Skepticism: Historical and Recent** Michael Della Rocca

An examination of the various styles of skeptical arguments and of responses to skepticism in the early modern period (17th and 18th centuries). Some attention also to comparisons between skepticism in this period and skepticism in contemporary philosophy, in ancient philosophy and in non-Western thought. Figures to be discussed include: Descartes, Spinoza, Leibniz, Astell, Hume, Sextus Empiricus, Zhuangzi, Nagarjuna. Prerequisites: At least two courses in philosophy, including PHIL 126 or Directed Studies or the equivalent. HU

* **PHIL 405b, Ethics of the Internet: Data, Algorithms, and Society** Joanna Blake-Turner

It is often said that the internet is just a tool. Like any other tool, its ethical impact (the argument goes) can be either positive or negative. What matters is how we use it. However, the internet is a tool whose functioning, unlike a hammer or screwdriver, is largely opaque to the average user. How do its algorithms work? What is the basis of the results that come up with a Google search or when there is a match on a dating app? Who knows personal search information and what are they using that information for?

In this class, we examine the features distinctive of online environments – including algorithms, machine learning, behavioral data collection, and social media – in order to examine how they shape the moral landscape. Topics covered include: algorithmic bias, surveillance capitalism, fake news, echo chambers, cancel culture, and the right to be forgotten. WR, HU

*** PHIL 417b, Animal Ethics Today** Jennifer Daigle

This course is designed to encourage grappling with some of the central questions in today's animal ethics literature, as well as with several prominent approaches to them. Among these questions are more fundamental ones concerning how to even approach questions surrounding the moral significance of the other animals and our treatment of them, as well as more derivative questions concerning particular practices. Included among these questions are: Do animals have moral status (indeed, is this even an illuminating question to ask)? If so, is it in virtue of their possession of certain properties#or something else entirely? Supposing animals do count morally, do humans still count more? What role, if any, should considerations of human happiness, virtue, and relationships with animals play in our moral theorizing? Do (some of) the other animals have a right to life? A right to flourish? Is it morally permissible to keep pets, or should we work toward a future without domesticated animals? And what, if anything, does addressing the situation of non-human animals have to do with addressing other social justice issues? We explore these questions through a variety of ethical frameworks, including utilitarian, deontological, and virtue-ethical ones. Prerequisites: One or two philosophy courses preferred or permission of instructor. WR, HU

*** PHIL 424a / GMAN 382a / JDST 217a, Hegel's Phenomenology of Spirit** Paul Franks and Hugo Havarnek

A close reading of sections of one of the major works in post-Kantian philosophy. Themes include varieties of scepticism and responses to scepticism; the relationship of epistemology to questions concerning structures of social practices of reasoning; the historical character of reason; the relationship between natural processes and social developments; the intersubjectivity of consciousness; and the possibility of a philosophical critique of culture. Attention paid both to commentaries that focus on historical development and to approaches that view historical narratives as allegories whose deeper meaning may be formulated as a logical or semantic theory. Two previous philosophy courses, including some exposure to Kant and German Idealism, through either DRST 004 or PHIL 126 or PHIL 214 or PHIL 261. Students are particularly encouraged but not required to take PHIL 261 before taking this course. HU

*** PHIL 425b, 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 427b, 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 428b, Ancient Moral Psychology** David Charles

The aim of the seminar is to examine Aristotle's discussion of the psychology of ethical virtue and of ethical failing, as exemplified by *acrasia* and various forms of vice, and to compare it with later discussions of similar topics, some ancient and some contemporary. The goal of the seminar is to answer the following two questions: did Aristotle develop a distinctive account of ethical motivation which resists analysis into two distinct, independently defined, components (such as reason or intellect and desire)? If so: does it withstand criticism from writers who analyse ethical motivation in terms of reason and/ or desire (as two independently defined components)? In addressing the second question we shall consider criticisms of, and alternatives to, Aristotle's account as developed in some Stoic sources, by David Hume and by some contemporary writers (such as John McDowell and Christine Korsgaard). The course is aimed at graduates and advanced undergraduates (seniors and juniors) in philosophy or classics. Priority will be given to these students for enrollment if necessary. Auditors are allowed subject to enrollment and with the permission of the instructor. Auditors will be expected to attend all classes, complete all reading assignments and participate in class discussion, but not to complete writing assignments. Knowledge of Greek is not required. HU

* **PHIL 429a / RLST 430a / SAST 470a and SAST 670a, Indian Philosophy in Sanskrit Literature** Aleksandar Uskokov

In this course we focus on issues of philosophical significance in Sanskrit literature of "non-standard" philosophical genres, i.e., other than the treatise and the commentary. Specifically we read from canonical Hindu texts such as the *Upaniṣads*, *Mahābhārata*, *Rāmāyaṇa*, *Bhāgavata Purāṇa*, *Bhagavad-gītā*, and *Yogavāsiṣṭha*; the classical genres of drama and praise poetry; and hagiographical literature, all in English translation. Attention is paid not only to substance but also form. The selection of philosophical problems includes philosophy of mind and personal identity; allegory; the ethics of non-violence; philosophy, politics, and religious pluralism; the highest good; theodicy; philosophical debate; etc. HU

* **PHIL 433a / ER&M 279a / HIST 295Ja / HUMS 286a, Mass Incarceration in the Soviet Union and the United States** Timothy Snyder and Jason Stanley

The Franke Seminar. An investigation of the experience and purposes of mass incarceration in the Soviet Union and the United States in the twentieth century. Incarceration is central to the understanding, if not usually to the self-understanding, of a society. It is thus a crucial aperture into basic questions of values and practices. This course proposes a frontal approach to the subject, by investigating two of the major carceral systems of the twentieth century, the Soviet and the American. Intensive reading includes first-person accounts of the Gulag and American prison as well as scholarly monographs on the causes of mass incarceration in different contexts. Brief account is taken of important comparative cases, such as Nazi Germany and communist China. Guest lectures and guest appearances are an important element of our teaching.

HU

* **PHIL 436a / PLSC 329a, Democracy, Science, and Climate Justice** Helene Landemore-Jelaca

Why is democracy, the most common regime form around the world, so slow in handling the vital threat of climate change? What role do scientists play and should play in a democracy? How should we approach the question of climate and environmental justice both at the local level, where climate change and pollution have a differential impact on different socio-economic and racialized communities, and at the global level, where the countries and people most affected by climate change have the least say and the biggest culprits few incentives to change their ways? This course aims to explore the intersection of democratic theory, science, and climate and environmental justice from the perspective of an empirically-informed political philosophy. SO

* **PHIL 437a, Philosophy of Mathematics** Sun-Joo Shin

We take up a time-honored debate between Platonism and anti-Platonism, along with different views of mathematical truth, that is, logicism, formalism, and intuitionism. Students read classical papers on the subject. Why do we need the philosophy of mathematics? This question could be answered toward the end of the semester, hopefully.

none HU

* **PHIL 439b, Modal Logic** Sun-Joo Shin

Basic philosophical concepts and logical tools underlying different modal systems, mainly focusing on necessity and possibility. Topics include propositional logic and its natural deductive system; modal operators and development of the simplest natural deductive system; extensions of the basic propositional modal system; intensional semantics; a diagrammatic method to check validity or invalidity; and quantified modal logic (QML). These topics lead to interesting philosophical issues and several non-standard logical assumptions. Prerequisite: basic knowledge of deductive systems. HU

* **PHIL 441b, Philosophy of Simone de Beauvoir** Manon Garcia

Simone de Beauvoir's *The Second Sex* is a benchmark feminist text. But its philosophical claims—and her other philosophical works—were overshadowed for much of her life for personal and professional reasons. For much of the twentieth century she was seen as derivative of her companion, Jean-Paul Sartre, and her work was given partial and problematic English translations that obscured their original richness. The recent publication in English of Beauvoir's student diaries and philosophical works has shown Beauvoir's work in new light. Through a thorough reading of Beauvoir's philosophical works and a selection of her feminist and literary works, this seminar is an in-depth, systematic study of her philosophy, and establishes her contributions to post-Kantian continental philosophy as well as to feminist philosophy. HU

* **PHIL 450a / EP&E 478a, The Problem of Evil** Keith DeRose and Miroslav Volf

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 453b, Good and Will** Michael Della Rocca

An exploration of the nature of moral reasons, the sources of normativity, the nature of good, and of related topics in philosophy of action. Focus on the (alleged) distinction between theoretical and practical reason, the (again alleged) distinction between

world-mind and mind-world directions of fit, the (again alleged) distinction between internal and external reasons, and theories of good. Authors to be covered include: Anscombe, Murdoch, Foot, Adams, Nagel, Michael Thompson, Strawson, Korsgaard, and Williams. Prerequisites: At least two courses in philosophy. HU

*** PHIL 455b / EP&E 334b, 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 459a, Philosophy of Citizenship** Jeremy Lent

For many of us, citizenship seems to amount to little more than voting and paying taxes. Our identities as family members, friends, classmates, colleagues, and so on are often far more salient than our identities as members of political units. But citizenship presents many significant philosophical questions and problems. In this course, we read and assess some of the most interesting arguments about what morality requires, permits, and forbids us to do as citizens. The questions we explore include: whether there is a moral duty to obey the law; how morality bears on voting, paying taxes, and philanthropy; whether patriotism is a virtue; and whether it is morally permissible or perhaps even obligatory to ignore politics. Overall, we seek to decide if citizenship is a more consequential component of our identities than we often imagine. Prerequisite: A course in either political philosophy or ethics. HU

*** PHIL 461a, Art and Morality** Mario Attie Picker

How do art and morality relate to each other? This course is an extended exploration of this question. We begin by asking whether morality plays (or should play) a role in our engagement with and evaluation of art. Are works of art susceptible to ethical assessment? And if they are, what is the relationship between their moral merits and their aesthetic ones? Is immoral art bad art? Or can a work be better by virtue of its immorality? We then reverse the equation and ask whether art plays (or should play) a role in our ethical lives. Can art communicate moral truths? Are there insights that only art can reveal (or that it is *best positioned* to reveal)? Or is knowledge simply irrelevant when it comes to art? Moving beyond knowledge, we ask the more general question of whether art is good for us. Can it make us better persons? Can it make us worse persons? Does it simply reflect (or distort) the world? Or can it change it? Finally, we ask if there is an intrinsic relation between the good and the beautiful. Is virtue beautiful? Is vice ugly? Prerequisite: A previous course in philosophy. WR, HU

*** PHIL 462b / EP&E 362b, The Morality of Reparations** Stephen Darwall

The history of chattel slavery and its long legacy, even to the current moment, is a history of almost unimaginable injustice. What is the appropriate moral response to this history? This turns out to be a complex and difficult question, or set of questions, which we explore in this course. Some of these are issues of philosophical theory, however, of “nonideal theory,” where the questions concern not what is ideally just, but what responses are called for by historical injustice. But there are also important empirical historical issues concerning the precise character of the injustices and who, and what institutions, were complicit in them. We examine, as best we can, the history

of chattel slavery and its long legacy: the white reaction to what Du Bois called “black reconstruction,” racist violence and terror, and decades of white supremacy, including segregation in all its forms and, most recently, mass incarceration. Ultimately, however, our questions are philosophical. What response does justice require to this history and of whom is it required? HU

* **PHIL 465b / EP&E 480b, Recent Work in Ethical Theory** Stephen Darwall

A study of recently published works on ethics and its foundations. Issues include the grounds of normativity and rightness and the role of the virtues. HU

* **PHIL 468a, 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 469a / GMAN 288a / HUMS 480a / LITR 482a, The Mortality of the Soul: From Aristotle to Heidegger** Martin Hagglund

This course explores fundamental philosophical questions of the relation between matter and form, life and spirit, necessity and freedom, by proceeding from Aristotle's analysis of the soul in *De Anima* and his notion of practical agency in the *Nicomachean Ethics*. We study Aristotle in conjunction with seminal works by contemporary neo-Aristotelian philosophers (Korsgaard, Nussbaum, Brague, and McDowell). We in turn pursue the implications of Aristotle's notion of life by engaging with contemporary philosophical discussions of death that take their point of departure in Epicurus (Nagel, Williams, Scheffler). We conclude by analyzing Heidegger's notion of constitutive mortality, in order to make explicit what is implicit in the form of the soul in Aristotle.

HU

* **PHIL 480a, Tutorial** Paul Franks

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 490a, The Senior Essay** Paul Franks

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 493b / ANTH 428b / RLST 428b, Neighbors and Others** Nancy Levene

This course is an interdisciplinary investigation of concepts and stories of family, community, borders, ethics, love, and antagonism. Otherwise put, it concerns the struggles of life with others – the logic, art, ethnography, and psychology of those struggles. The starting point is a complex of ideas at the center of religions, which are given to differentiating "us" from "them" while also identifying values such as the love

of the neighbor that are to override all differences. But religion is only one avenue into the motif of the neighbor, a fraught term of both proximity and distance, a contested term and practice trailing in its wake lovers, enemies, kin, gods, and strangers. Who is my neighbor? What is this to ask and what does the question ask of us? Course material includes philosophy, anthropology, psychology, fiction, and film. HU

Physics (PHYS)

* **PHYS 040a / ASTR 040a, 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. Preregistration required; see under First-Year Seminar Program. SC

* **PHYS 050a or b / APHY 050a or b / ENAS 050a or b, 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. Preregistration required; see under First-Year Seminar Program. SC

* **PHYS 100b / APHY 100b / ENAS 100b / EPS 105b / EVST 100b, 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

PHYS 151a or b / APHY 151a or b / ENAS 151a 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 165La, General Physics Laboratory Sean Barrett, Stephen Irons, Sidney Cahn, and Mehdi Ghiassi-Nejad

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 ½ Course cr

PHYS 170a, University Physics for the Life Sciences Alison Sweeney

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

PHYS 180a and PHYS 181a, University Physics Adriane Steinacker

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 200a, Fundamentals of Physics Paul L. Tipton

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 210 and either MATH 225 or MATH 222, are generally taken concurrently. See comparison of introductory sequences and laboratories in the YCPS. QR, SC

PHYS 205a and PHYS 206a, Modern Physical Measurement Helen Caines and Stephen Irons

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 RP ½ Course cr per term

PHYS 260a, Intensive Introductory Physics Steven Girvin

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, MATH 230 and 231, or PHYS 301, or equivalent. QR, SC

PHYS 293a / APHY 293a, 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 295a / ASTR 255a, Research Methods in Astrophysics Hector Arce

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 301a, Introduction to Mathematical Methods of Physics Vincent Moncrief

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 342a / EPS 342a, 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 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. Recommended preparation: familiarity with basic calculus and differential equations. QR, SC

PHYS 353b / BENG 353b, 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, 181, MATH 115, and ENAS 194. QR

*** PHYS 378a, 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 382La, Advanced Physics Laboratory** Reina Maruyama, Sidney Cahn, and Steve Lamoreaux

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 401a, Advanced Classical Physics from Newton to Einstein Nikhil Padmanabhan

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 410a, Classical Mechanics Keith Baker

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 412a, Relativity Witold Skiba

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 420a / APHY 420a, Thermodynamics and Statistical Mechanics** Meng Cheng

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 428a / AMTH 428a / E&EB 428a / EPS 428a, Science of Complex Systems Jun Korenaga

Introduction to the quantitative analysis of systems with many degrees of freedom. Fundamental components in the science of complex systems, including how to simulate complex systems, how to analyze model behaviors, and how to validate models using observations. Topics include cellular automata, bifurcation theory, deterministic chaos, self-organized criticality, renormalization, and inverse theory. Prerequisite: PHYS 301, MATH 247, or equivalent. QR, SC

PHYS 439a / APHY 439a, Basic Quantum Mechanics Sohrab Ismail-Beigi

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 441a, Quantum Mechanics and Natural Phenomena II Ramamurti Shankar
Continuation of PHYS 440. Prerequisite: PHYS 440 and either PHYS 430 or permission of the instructor. QR, SC

PHYS 448a / APHY 448a, 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 449b / APHY 449b, Solid State Physics II Vidvuds Ozolins
The second term of the sequence described under APHY 448. QR, SC

PHYS 458a / APHY 458a, 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 460a, Mathematical Methods of Physics Nicholas Read
Survey of mathematical techniques useful in physics. Physical examples illustrate vector and tensor analysis, group theory, complex analysis (residue calculus, method of steepest descent), differential equations and Green's functions, and selected advanced topics. Prerequisite: PHYS 301 or other advanced mathematics course. QR

* **PHYS 469a, Independent Research in Physics** Charles Baltay
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 471a, Independent Projects in Physics** Charles Baltay
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 110a, 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 120b, Elementary Polish II Krystyna Illakowicz

Continuation of PLSH 110. After PLSH 110 or equivalent. L2 RP 1½ Course cr

PLSH 130a, 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 140b, Intermediate Polish II Krystyna Illakowicz

Continuation of PLSH 130. After PLSH 130 or equivalent. L4 RP 1½ Course cr

*** PLSH 150a, 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

*** PLSH 248b / THST 370b, Polish Theater and Its Traditions** Krystyna Illakowicz

Exploration of the rebellious, defiant, and explosive nature of Polish theater, including ways in which theater has challenged, ridiculed, dissected, and disabled oppressive political power. Polish experimental and absurdist traditions that resulted from a merger of the artistic and the political; environmental and community traditions of the Reduta Theatre; Polish-American theater connections. Includes attendance at live theater events as well as meetings with Polish theater groups and actors. HU TR

Political Science (PLSC)

*** PLSC 027b, From Protest to Power: Social Movements in Comparative Perspective**

Leanna Barlow

This course seeks to provide students with a general understanding of the theoretical underpinnings of the social movement as a form of collective action. Social movements, at heart, aim to bring about political, economic, or cultural change. From the American Civil Rights Movement to the formation of Transnational Advocacy Networks, social movements have shaped the contemporary political landscape in countries all over the world. This course draws on a range of historical and contemporary case studies to examine social movements in a comparative perspective. Key questions include: Why do movements occur, who participates, what strategies or tactics are used, how do institutions respond, and what is the impact of collective action? Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.

SO

*** PLSC 028a, 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. Preregistration required; see under First-Year Seminar Program. SO

*** PLSC 031a / EDST 031, Child, Family, and State** William Garfinkel

This course explores the allocation and exercise of authority over children and examines in detail significant situations in which children, parents, and their advocates encounter

the legal system. We look at many issues from a historical perspective. Topics include the police power of the state, eugenic legislation, child abuse and neglect, the legal status of fetuses, the law of privacy, ethical and legal issues in pediatric and reproductive medicine, juvenile justice, child pornography and exploitation, and children's rights and restrictions on children's liberty in school and the society at large. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. SO

*** PLSC 035b / HIST 025b / HUMS 035b, 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. Preregistration required; see under First-Year Seminar Program. SO

*** PLSC 075b / ANTH 021b, Memorialization of Mass Atrocities in the Digital Age** David Simon

This seminar explores the means, methods, and meaning of digitization of memorialization of mass violence. Along the way, we address a series of questions, such as "How has digitization changed the way in which violent pasts are represented, shared, and remembered?", "How do the means of memorialization influence what gets remembered?", "What advantages#and what risks#does digital media pose for the project of memorialization?", "How can digital technology be used#and perhaps misused#in the service of memorialization?", "In what directions#and to what consequences#can we expect memorialization to move in the future, in light of technological change?" The course is premised on the notion that memorialization is a key project that allows individuals, communities, and societies to process episodes of mass violence in their own recent#or even distant#pasts. SO

PLSC 111b / GLBL S268Eb / PLSC S111E, Introduction to International Relations Kenneth Scheve

Survey of key debates and concepts in international relations. Exploration of historical and contemporary issues using Western and non-Western cases and evidence. Topics include the rise of states; causes, conduct, and outcomes of wars; the emergence of new actors and forms of conflict; and evolution of global economy. SO

PLSC 113a, Introduction to American Politics Amir Fairdosi

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

PLSC 114a, Introduction to Political Philosophy Giulia Oskian

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

PLSC 116b, Comparative Politics: States, Regimes, and Conflict Ana De La O

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

PLSC 121a / MMES 121a, International Relations of the Middle East Nicholas Lotito

This course explores the multiple causes of insecurity in the Middle East and North Africa, a region of paramount geostrategic interest, whose populations have suffered from armed conflicts both within and across national borders. The first half of the course interrogates traditional security concepts like war, terrorism, and revolution, as well as the political, economic, and social contexts which give rise to these phenomena. The course then turns to foreign policy analysis in case studies of the region's major states. Previous coursework in international relations and/or Middle East politics or history recommended but not required. SO

*** PLSC 123a, Political Economy of Foreign Aid** Peter 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 130b / GLBL 260b, Nuclear Politics Alex Debs

The pursuit, use, and non-use of nuclear weapons from the Manhattan Project to the present. The effect of the international system, regional dynamics, alliance politics, and domestic politics in the decision to pursue or forgo nuclear weapons. The role of nuclear weapons in international relations, the history of the Cold War, and recent challenges in stemming nuclear proliferation. SO

*** PLSC 135b / AFST 135b, Media and Conflict** Graeme Wood

The theory and practice of reporting on international conflict and war, and its relation to political discourse in the United States and abroad. Materials include case studies of media coverage of war in Europe, Africa, and the Middle East.

*** PLSC 137b / GLBL 274b, Terrorism** Bonnie Weir

Theoretical and empirical literature used to examine a host of questions about terrorism. The definition(s) of terrorism, the application of the term to individuals and groups, the historical use and potential causes of terrorism, suicide and so-called religious terrorism, dynamics within groups that use terrorism, and counterterrorism strategies and tactics. Theoretical readings supplemented by case studies. SO

*** PLSC 138b / MGRK 236b / SOCY 221b, The Euro Crisis** Paris Aslanidis

Examination of how Europe continues to struggle with the social and economic repercussions of the Great Recession and the impact of socioeconomic asymmetries in countries such as Portugal, Ireland, Spain, Italy, and Greece. Topics include the euro as a viable common currency; why and how the Euro crisis erupted and spread; how the COVID-19 fallout will impact the Union. SO

PLSC 148b / HMRT 100b, Theories, Practices, and Politics of Human Rights Jim Silk

Introduction to core human-rights issues, ideas, practices, and controversies. The concept of human rights as a philosophical construct, a legal instrument, a political

tool, an approach to economic and equity issues, a social agenda, and an international locus of contestation and legitimation. Required for students in the Multidisciplinary Academic Program in Human Rights. SO

PLSC 149a / EVST 292a / GLOBL 217a, Sustainability: Environment, Energy, and the

Economy in the 21st Century Daniel Esty

Sustainability as a guiding concept for addressing twenty-first century tensions between economic, environmental, and social progress. Using a cross-disciplinary set of materials from the “sustainability canon,” students explore the interlocking challenges of providing abundant energy, reducing pollution, addressing climate change, conserving natural resources, and mitigating the other impacts of economic development. SO

*** PLSC 161a / GLOBL 344a / HIST 483Ja, Studies in Grand Strategy II** Beverly Gage

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

*** PLSC 162a, Japan and the World** Frances McCall Rosenbluth

The historical development of Japan's international relations since the late Tokugawa period; World War II and its legacy; domestic institutions and foreign policy; implications for the United States; and interactions between nationalism and regionalism. SO

*** PLSC 173a / GLOBL 216a, Democracy Promotion and Its Critics** Sarah Bush

A seminar on the history, justifications, and various forms of democracy promotion – and their controversies. Topics include foreign aid, election observers, gender, international organizations, post-conflict development, revolutions, and authoritarian backlash.

PLSC 175a / AFST 175a, Africa in International Relations David Simon

This course examines key facets of how African countries interact with the rest of the world, and with other countries on the continent. Focusing mostly on Sub-Saharan African countries, it looks at international economic relations (focusing on aid but also addressing trade, investment, and debt); peacemaking and peacebuilding; and regional governance institutions. SO

PLSC 177b / EP&E 331b, Networks and NGOs in World Politics Sarah Bush

Non-state actors are increasingly important to world politics. This course introduces students to the variety of non-state actors that are currently influencing our world, including non-governmental organizations (NGOs) and transnational networks related to advocacy, crime, global governance, and violence. Students develop a working understanding of these actors' roles in shaping war, peace, human rights, democracy, the global economy, and various other aspects of contemporary global politics. SO

PLSC 182a / GLBL 236a, The Politics of International Law and Cooperation Tyler Pratt

This course focuses on the political processes and institutions that facilitate cooperation among states. Students examine the obstacles to cooperation in the international arena, the reasons for the creation of international laws and institutions, and the extent to which such institutions actually affect state policy. Students also explore the tension between international cooperation and concerns about power, state sovereignty, and institutional legitimacy. Course materials draw from a variety of substantive issues, including conflict prevention, trade, human rights, and environmental protection. SO

*** PLSC 185b, Challenges to International Order** Tyler Pratt

At the end of World War II, states crafted a set of rules, institutions, and organizations to limit conflict and promote cooperation. Seventy-five years later, the “liberal international order” is showing serious signs of wear. This course examines a range of historical and contemporary challenges to international order. SO

PLSC 186b / GLBL 203b, Globalization and Domestic Politics Didac Queralt

Examination of the political and institutional conditions that explain why some politicians and interest groups (e.g. lobbies, unions, voters, NGOs) prevail over others in crafting foreign policy. Consideration of traditional global economic exchange (trade, monetary policy and finance) as well as new topics in the international political economy (IPE), such as migration and environmental policy.

PLSC 188a / GLBL 275a, Approaches to International Security Dawn Brancati

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

*** PLSC 193a / GLBL 218a / MMES 318a, Security in North Africa and the Middle East** Staff

This course explores the debates about regional security in North Africa and the Middle East, mainly from a critical security perspective. Traditional and non-traditional security challenges are discussed throughout the semester. The state is presented as much a subject of security as a subject of insecurity for individuals and groups of people. This is to say that security here is not state-centered. North Africa and the Middle East are mostly dealt with separately, with very few exceptions. SO

*** PLSC 209a / HIST 167Ja, Congress in the Light of History** David Mayhew

This course begins by studying analytic themes, including congressional structure, incentives bearing on members and parties, conditions of party control, supermajority rules, and polarization, followed by narrative works of major political showdowns entailing Congress such as those in 1850, 1876-77, 1919 (defeat of the Versailles Treaty), 1937 (defeat of court-packing), 1954 (the McCarthy-Army hearings), 1964 (civil rights), 1973-74 (Watergate), and 1993-94 (defeat of health care). Students also examine a series of policy performances, for the better or the worse in today’s judgments, ranging from early state-building through reacting to the Great Depression, constructing a welfare state, and addressing climate change. This is a reading course and does not accommodate senior essays. SO

* **PLSC 210a, Political Preferences and American Political Behavior** Peter Aronow
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 212a / EP&E 390a / EVST 212a, 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 215b / EVST 255b / F&ES 255b / GBL 282b, Environmental Law and Politics: Global Food Challenges** John Wargo

We explore relations among food, environment, health, and law. We consider global-scale *avoidable* challenges such as: starvation and malnutrition, obesity, other food related human diseases, climate instability, soil loss, water depletion and contamination, microbial hazards, chemical contamination, food waste, dietary convergence, air pollution, energy, packaging, culinary globalization, and biodiversity loss. We focus on laws that influence the world's food system, including those intended to reduce or prevent environmental and health damages. Other laws protect rights of secrecy, property, speech, confidential business information, free trade, worker protection, equal opportunity, and freedom from discrimination. Ethical concerns of justice, equity, and transparency are prominent themes. Examples of effective law, consumer movements and corporate innovations provide optimism for the future of responsible food. so

* **PLSC 216a, Money in American Politics** Jacob Hacker

This course offers students an opportunity to do hands-on research on the role of money in shaping American politics and policy at the national, state, and local levels. Students assimilate existing research and theories and identify opportunities for new research and theories, and then carry out this original work in a collaborative setting. Topics include campaign finance, the role of "dark money," lobbying, interest groups, the influence of employers, and the role of philanthropies and foundations. This course requires sufficient prior coursework in political science to grasp high-level concepts and research. Prior coursework on social science methods is preferable but not required. Above all, it requires a passion for conducting new research. so

* **PLSC 223a / EDST 223a, Learning Democracy: The Theory and Practice of Civic Education** Amir Fairdosi

This is a seminar on the theory and practice of civic education. We begin by investigating philosophies of civic education, asking such questions as: What is civic education and what is its purpose? What knowledge, skills, and values promote human flourishing and the cultivation of a democratic society? What roll can and should schools play in this cultivation? In the next part of the course we focus on civic education in practice, exploring various approaches to teaching civics and the empirical evidence in support of each method's effectiveness. We also discuss variations in access to civic education opportunities across socioeconomic, demographic, and national contexts, and how societies might deal with these disparities. so

* **PLSC 224a, Political Leadership** Stephen Skowronek

Examination of political leadership as both a concept and a practice. Survey of classic works by Machiavelli, Carlyle, Weber, Lenin, and Schumpeter. Consideration of the difference between transformational leadership and transactional leadership, and between executive leadership and reform leadership. Issues include the conundrum of "democratic leadership" and the role of narrative in leadership. WR, SO

* **PLSC 228a / EP&E 306a, 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 233b, Constitutional Law Akhil Reed Amar

An introduction to the main themes of the American Constitution – popular sovereignty, separation of powers, federalism, and rights – and to basic techniques of constitutional interpretation. Special emphasis on the interplay of constitutional text, judicial doctrine, and constitutional decision making outside the judiciary. SO

* **PLSC 236b, Presidential Campaigns and the Media** Walter Shapiro

The intersection of two institutions in the midst of major transformations – the political campaign industry and the news business. Presidential campaign coverage during the last third of the twentieth century; the beleaguered economic structure of the news business in the twenty-first century; media coverage of the 2008 and 2012 presidential races, with emphasis on how campaigns adapted to the changed news landscape and to new ways of communicating with voters. SO

* **PLSC 237b, Persuasion and Political Communication** John Henderson

The history of political communication, persuasion, and demagoguery in the American political tradition, from the design and ratification of the Constitution to modern debates over terrorism and authoritarianism. The limits of democratic deliberation and representation; elite communication strategies that influence policy making and elections. SO

* **PLSC 238a / EDST 238a, The Education Beat: Writing on Policy, Learning, and Life**

Jane Karr

Exploration of the national conversation around education issues, and how to write smartly about them. Classes delve into top stories of the last few years – diversity and desegregation, school choice and culture wars, and Covid-19. Students learn journalistic values and methods and how to develop marketable ideas. The class examines approaches to nonacademic writing, including opinion and narratives, and then puts them into practice. Journalists who cover education are frequent guests. WR, SO

* **PLSC 247a / AMST 245a / ENGL 246a, The Media and Democracy** Joanne Lipman
 In an era of "fake news," when mainstream media is attacked as the "enemy of the people" and social platforms are enabling the spread of misinformation, how do journalists hold power to account? Students explore topics including objectivity versus advocacy, and hate speech versus First Amendment speech protections. Case studies will span from 19th century yellow journalism to the media's role in #MeToo and #BlackLivesMatter movements. SO

* **PLSC 253a or b / ENGL 467a or b, Journalism** Staff
 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

PLSC 254a, Political Parties in the American System John Henderson
 The evolution of American political parties and the role of parties and partisanship in contemporary government and elections. Empirical and theoretical accounts of parties, including divided government, parties in Congress, realignment, responsible party government, party identification, and ideology. Elite-led polarization, decline and resurgence of strong parties, and the antiparty constitutional tradition. SO

PLSC 257b, Bioethics and Law Stephen Latham
 The treatment by American law of major issues in contemporary biomedical ethics: informed consent, assisted reproduction, abortion, end-of-life care, research on human subjects, stem cell research, and public health law. Readings include legal cases, statutes, and regulations. No background in law assumed. SO

PLSC 262b / AMST 209b / ER&M 223b, Race, Politics, and the Law Daniel HoSang
 Examination of how race—as a mode of domination and resistance—has developed and transformed in the United States since the early-twentieth-century. How political actors and social movements engage the law to shape visions of freedom, democracy, and political life. Consideration of critical race theory, political discourse analysis, intersectionality and women of color feminism, and American political development. SO

PLSC 263b / AFAM 164b / URBN 304b, The Politics of "The Wire": HBO's Portrayal of the American City Allison Harris
 This class uses HBO's groundbreaking series "The Wire" to investigate cities, their problems, and their politics. We watch all five seasons of the show as social scientists and use it to learn about important social scientific concepts and theories, and apply those theories to such phenomena as the politics of crime, policing, and local elections. Each week, the assigned readings—articles and book excerpts from political science as well as other social sciences—highlight the social scientific concepts displayed in the assigned episodes and provide context for lectures. All of the assignments work together to expose students to social science, how social science is conducted, and how political science can help us better understand the world around us. SO

*** PLSC 269a / AMST 427a / WGSS 427a, Politics of Gender and Sexuality in the United States** Dara Strolovitch

The 2016 Presidential election made clear that gender matters a great deal in American politics, but it also revealed that *how* gender matters is far from obvious. This course explores the ways in which gender and sexuality shape and are shaped by American politics and public policy. We explore the history, findings, and controversies in research about gender and sexuality in American politics from a range of approaches, examining what political science research helps us understand about questions such as: Does gender influence political campaigns and whether people will vote for particular candidates? Once elected, are gender and sexuality related to legislators' behavior in office? How are norms related to race, class, gender, and sexuality reflected in and constructed by public policy? We also explore feminist, queer, and intersectional theories and methodologies and important work from other disciplines and interdisciplines, paying particular attention to the implications of intersectionality for understanding gender, sexuality, and politics. We also analyze the ways in which gender and sexuality intersect with other politically salient categories, identities, and forms of marginalization, including race, ethnicity, class, and ideological and partisan identification, paying particular attention to their implications for the 2016, 2018, and 2020 elections. SO

*** PLSC 271b, Policymaking under Separation of Powers** Christina Kinane

This seminar provides an overview of the literature on the politics of separation of powers, with an eye toward understanding how the various interbranch constraints on American political institutions impact the development and implementation of public policy. SO

*** PLSC 274a, 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 275a / AMST 487a, The Rise of "Presidentialism" in the United States**

Stephen Skowronek

This course is about the rise and makeshift character of "presidentialism" in the United States. It will examine different sources of power that have, singly and in combination, put the presidency at the center of government and politics. These include: 1) popular power: in elections, public opinion, parties, and social movements; 2) institutional power: in control of the executive branch, military command, and war making. Readings will delve into cases in which each of these sources of power figured prominently. In every particular, the seminar will consider the strains that this power has put on the constitutional frame. For advanced undergraduates, or by permission SO

PLSC 277b, The United States Congress Amir Fairdosi

This is a survey course on the United States Congress, divided into two parts. In Part I, we discuss the theoretical and historical foundations of legislative government in the United States. In Part II, we move beyond theories of legislating and on to the way Congress operates in practice. We explore such questions as: How do congressional

elections work? What are the causes and effects of political polarization? How would term limits affect policy outcomes? What is the effect of money on Congress? Where do/should constituents fit in in all this? How does Congress interact with the President and the bureaucracy? Why is Congress's approval rating lower than any other institution in the country? SO

*** PLSC 282a / AFAM 247a / HUMS 216a, Democracy and Race in America: Thinking with Tocqueville and Du Bois** Giulia Oskian

Racial and economic inequalities have remained unsolved problems in American democracy since independence. For this reason, both historian Eric Foner and poet Amanda Gorman recently claimed that American democracy is still unfinished. To what extent and in what ways could pre-civil war America be considered democratic? What challenges did the democratic project face in the aftermath of the civil war and slave emancipation? How do these challenges still influence the American political life? This seminar addresses these questions with the two classical texts that are rarely read together: Alexis de Tocqueville's *Democracy in America* and W. E. B. Du Bois's *Black Reconstruction in America*. HU, SO

PLSC 290a / SOCY 151a, Foundations of Modern Social Theory Emily Erikson

Major works of social thought from the beginning of the modern era through the 1900s. Attention to social and intellectual concepts, conceptual frameworks and methods, and contributions to contemporary social analysis. Writers include W.E.B. Du Bois, Simone de Beauvoir, Adam Smith, Thomas Hobbes, Jean-Jacques Rousseau, Immanuel Kant, Emile Durkheim, Max Weber, and Karl Marx. SO

*** PLSC 295b, The Idea of Statesmanship** Steven Smith

Who is a statesman and what are the ideal qualities required for the office? This remains one of the enduring questions of political philosophy. This course examines the art of statesmanship in ancient and modern political thought. We consider examples of statecraft in both ancient Greece and Rome and the Hebrew Bible before viewing examples of modern statesmanship using Machiavelli, Hume, Burke, the *Federalist Papers*, and Abraham Lincoln. We consider the statesman's role in different contexts, as political founder, preserver, and reformer. We also consider what kind of education is necessary to best carry out the work of statecraft. HU

*** PLSC 297a / EP&E 312a, Moral Choices in Politics** Boris Kapustin

A study of how and why people make costly moral choices in politics. Figures studied include Thomas More, Abraham Lincoln, Nelson Mandela, Václav Havel, and Aung San Suu Kyi. SO

PLSC 298b / WGSS 207b, Gender, Justice, Power, Institutions Joseph Fischel

Examination of how inequalities based on gender, race, caste, class, sexuality as well as a host of other identities are embedded in institutions that make up our social world. From the family and the home to the workplace, from the University, and the Corporation, to the Military and Media, we track how inequalities emerge and are sustained by power and institutional structures. We also see how they are challenged and what sorts of instruments are needed to challenge them. In particular, we focus on sexual politics and sexual violence as a key issue to understanding the gendered workings of institutions, in order to examine structures that sustain inequality. Through the semester, we hope to consider many domains of life—bedrooms and boardrooms, international borders and feminist movements—to understand the

stubborn and sticky forms and hierarchies of power that are challenged and contested by activists, scholars, and communities.

* **PLSC 301a / HUMS 363, Machiavelli and Machiavellianism** Steven Smith
Machiavelli remains the most widely discussed and debated figures in the Western political canon. This course offers a close reading of this two major treatises, the *Prince* and the *Discourses on Livy* as well as important sections from Livy's history of Rome. We then consider influential nineteenth and twentieth century interpreters of Machiavelli from Hegel to Gramsci to Leo Strauss. Prerequisites: DS, Intro to Political Philosophy, or some familiarity with Early Modern Intellectual History. HU, SO

* **PLSC 304b / EP&E 325b, Business Ethics and Law** Robin Landis
This seminar is intended to provide frameworks for the analysis of ethical issues that may arise in the context of business decisions, including such aspects as the role of ethics, competing values and interests, and tools for making principled decisions. The course also covers, as appropriate, some aspects of law as they relate to business ethics. Previous courses in philosophy and ethics may be helpful. SO

* **PLSC 305b / EP&E 353b, Critique of Political Violence** Boris Kapustin
Methods of conceptualizing political violence that are prevalent in contemporary political philosophical discourse. Use of theoretical-analytical tools to examine the modes violence assumes and the functions it performs in modern political life as well as the meanings and possibilities of nonviolence in politics. SO

* **PLSC 312a, Punishment** Alexander Rosas
This course is about punishment. The power of the state to restrict freedom, to impose pain, even death, and to mark one as 'criminal' is remarkable, and this course interrogates the theories that underlie that power. In what cases and for what reasons should the state have the power to punish, and where should the moral and legal limits on that power lie? What should the goals of punishment be, and which forms of punishment align most closely with them? What is the nature and desired role of vengeance and mercy in determining whether, when, and how to punish? What obligations should a society have to punish but also to those whom it punishes? Should the state have the power to shame and humiliate? What does punishment reveal about society more broadly? This course considers these and other related questions primarily through works in political and legal theory, but it also takes an interdisciplinary approach and elaborates and evaluates the theoretical materials through a discussion of numerous legal and other case studies. SO

* **PLSC 313a / EP&E 380a, Bioethics, Politics, and Economics** Stephen Latham
Ethical, political, and economic aspects of a number of contemporary issues in biomedical ethics. Topics include abortion, assisted reproduction, end-of-life care, research on human subjects, and stem cell research. SO

* **PLSC 319a, Aristotle's Political Thought** Bryan Garsten
A careful reading of Aristotle's *Nicomachean Ethics* and *Politics*, along with selected debates in the secondary literature. Consideration of Aristotle's place in recent political theory. SO

* **PLSC 320b / EP&E 421b, Ethics, Law, and Current Issues** Karen Goodrow
Examination of how freedom of speech and bias influence the criminal justice system, focusing on wrongful convictions and administration of the death penalty. Understanding the role of potential bias at various levels and the competing interests of

protecting speech, due process, and the innocent. Topics include limitations on speech, practical effects of speech, the efficacy of the death penalty, actual innocence, gender/race/economic bias and its effects on the justice system, as well as best practices for improving our sense of justice.

*** PLSC 324a / AFST 324a / EP&E 317a / HIST 368Ja, Nelson and Winnie Mandela**
Jonny Steinberg

A study of Nelson and Winnie Mandela's marriage and public careers and the political and philosophical questions the marriage raises. Students examine the Mandelas' conflicting ideas on race and on the colonial experience and compare them to those of Mohandas Gandhi and Franz Fanon. Students also read recent philosophical work on forgiveness and on violence in order critically to assess the politics of reconciliation that so divided the Mandelas. The course examines the politics of global celebrity and the portrayal of men and women in public media.

*** PLSC 329a / PHIL 436a, Democracy, Science, and Climate Justice** Helene Landemore-Jelaca

Why is democracy, the most common regime form around the world, so slow in handling the vital threat of climate change? What role do scientists play and should play in a democracy? How should we approach the question of climate and environmental justice both at the local level, where climate change and pollution have a differential impact on different socio-economic and racialized communities, and at the global level, where the countries and people most affected by climate change have the least say and the biggest culprits few incentives to change their ways? This course aims to explore the intersection of democratic theory, science, and climate and environmental justice from the perspective of an empirically-informed political philosophy. so

*** PLSC 330b, 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 332a / EP&E 299a / GLBL 299a, Philosophy of Science for the Study of Politics** Ian Shapiro

An examination of the philosophy of science from the perspective of the study of politics. Particular attention to the ways in which assumptions about science influence models of political behavior, the methods adopted to study that behavior, and the relations between science and democracy. Readings include works by both classic and contemporary authors. so

*** PLSC 337a, Social Science in Action** Staff

What are the social sciences for? What role do they play in society? Do they have a political, ideological, or moral component? To what extent and how can they inform public policies, shape legal decisions, and influence the broader culture? How are they in turn influenced by extra-scientific actors controlling access to funding, education policy, and legal limitations to social research? How did the relations between the social sciences and society change over time and across countries? How are students and scholars in these fields different from other social groups and how do they relate to them? Are the social sciences traversed by the same fault lines that divide society at

large? Drawing on historical, sociological, and philosophical scholarship, this course considers the social sciences as an object of study. SO

PLSC 341b / GBL 195b, The Logic of Randomized Experiments in Political Science

Alexander Coppock

Instruction in the design, execution, and analysis of randomized experiments for businesses, nonprofits, political organizations, and social scientists. Students learn to evaluate the impact of real-world interventions on well-defined political, economic, and social outcomes. Specific focus on randomized experimentation through field and survey experiments, with design and analysis principles extending to lab and so-called "natural" experiments. Any introductory probability or statistics course. QR, SO

PLSC 342b / EP&E 220b, Strategic Models of Politics Milan Svulik

Introduction to formal political theory including application of rational choice and game theoretic analysis. Key topics and findings include: why voters vote in elections; how candidates choose platforms; why common resources tend to be overexploited; whether the state is needed for public good provision; how electoral systems shape politicians' and voters' behavior; whether voters can hold politicians accountable for their performance in office; how constitutions affect politicians' incentives to compromise; and why countries fight wars. SO

PLSC 344a / EP&E 295a, Game Theory and Political Science Ian Turner

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

PLSC 349a, Visualization of Political and Social Data Alexander Coppock

This course is an introduction to data visualization with a focus on political and social data. Our main textbook is *The Visual Display of Quantitative Information* by Edward Tufte, a foundational book that explores the history of data visualization and offers a perspective on how graphs should be constructed. We also learn from other visualization pioneers not included in Tufte's review such as W.E.B. Du Bois and Florence Nightingale. Our secondary textbook is the ggplot2 book by Hadley Wickham, an indispensable resource for constructing statistical graphs in the programming language R. The main goal of the course is to help students to communicate both "what we know and why we think we know it" through excellent data visualization. Prerequisite: Introductory course in statistics and probability. Background familiarity with learning from random samples and the construction of confidence intervals is useful. Students do not need to know how to program in R as it will be covered extensively. QR, SO

* **PLSC 354a / EP&E 250a, 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 357b / EAST 310b / GBL 309b, The Rise of China Daniel Mattingly

Analysis of Chinese domestic and foreign politics, with a focus on the country's rise as a major political and economic power. Topics include China's recent history, government, ruling party, technology, trade, military, diplomacy, and foreign policy. SO

*** PLSC 358b, Comparative Political Parties and Electoral Systems** Andrea Aldrich

This course explores democratic representative through political parties around the world and the effects of electoral systems on party system development. In doing so, we critically examine the role of political parties in the representation of societal interests, party system evolution, the consequences of electoral law, and challenges facing modern political parties today with a particular focus on the growth of authoritarian and far right parties around the world. Prerequisite: It is helpful, although not mandatory, to have taken Intro to American Politics and Intro to Comparative Politics. A course on research design in the Social Sciences is also helpful. SO

PLSC 359b / ECON 340b, Economics and Politics of Development Gerard Padro

This course covers recent scholarship on the political economy of development. It starts with the study of macro-historical facts and move on to micro issues, such as conflict and corruption. Prerequisite: Intermediate microeconomics and Econometrics (ECON 117 or equivalent).

*** PLSC 361a, Democratic Backsliding** Milan Svobik

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 369b / CPSC 210b, Power, Security, and Surveillance: Political Challenges of the Computer Age Joan Feigenbaum

Twenty-first century societies are faced with both threats and opportunities that combine sophisticated computation with politics and international relations in critical ways. Examples include cyber warfare; cyber espionage; cyber crime; the role of social media in democratic self-governance, authoritarian control, and election "hacking"; cryptocurrencies; and mass surveillance. This course examines the political challenges wrought by massive increases in the power of computational and communication technologies and the potential for citizens and governments to harness those technologies to solve problems. It is co-taught by one faculty member in computer science and one in political science. No previous programming experience required. Meets with CPSC 310. Students may earn credit for CPSC 210/PLSC 369 or for CPSC 310; not for both. Prerequisite: Internet literacy. SO

*** PLSC 374b / ECON 449b / EP&E 244b, The Economic Analysis of Conflict** Gerard Padro

Since the end of WWII the overwhelming majority of war casualties have been the result of internal conflict. This includes insurgency situations in which foreign powers prop up a weak internal government. In this course we apply microeconomic techniques, theoretical and empirical, to the analysis of internal conflict, its causes and consequences. Topics include forced migration, ethnic conflict, long-term consequences of war and individual choices to participate in violence. Readings comprise frontier research papers and students will learn to critically engage with cutting-edge research designs. Prerequisites: Intermediate microeconomics and econometrics. SO

* **PLSC 375a / GBL 215a / LAST 386a / MGRK 237a / SOCY 389a, Populism** Paris Aslanidis

Investigation of the populist phenomenon in party systems and the social movement arena. Conceptual, historical, and methodological analyses are supported by comparative assessments of various empirical instances in the US and around the world, from populist politicians such as Donald Trump and Bernie Sanders, to populist social movements such as the Tea Party and Occupy Wall Street. so

PLSC 378a / AFAM 186a / LAST 214a / SOCY 170a, Contesting Injustice Elisabeth Wood

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 freshmen and sophomores. so

PLSC 382b, Introduction to Latin American Politics Emily Sellars

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

* **PLSC 391a / EP&E 302a / GBL 259a / HIST 469Ja, State Formation** Didac Queralt
Study of the domestic and international determinants of functional states from antiquity to date. Analysis of state-formation in Europe in pre-modern and outside Europe from colonial times to date. Topics include centralization of power, capacity to tax, and contract enforcement. so

* **PLSC 410a, Political Protests** Maria Jose Hierro

The 2010s was the “decade of protest,” and 2019 capped this decade with an upsurge of protests all over the world. In 2020, amidst the Covid-19 pandemic, the US is witnessing the broadest protests in its history. What are the roots of these protests? Under what conditions does protest start? Why do people decide to join a protest? Under what conditions do protests succeed? Can repression kill protest movements? Focusing on recent protest movements across the world, this seminar addresses these, and other questions related to the study of political protest. so

* **PLSC 412a / PLSC 780, Law & Society in Comparative Perspective** Egor Lazarev
This advanced seminar is about the functions of law across historical, political, and cultural contexts. We discuss what is law, why people obey the law, and how do societies govern themselves in the absence of strong state legal institutions. The class explores the relationship between law and colonialism, the functioning of law under the authoritarianism and democracy, and in conflict-ridden societies. so

* **PLSC 415a / EP&E 241a / SOCY 172a, Religion and Politics in the World** Katharine Baldwin

A broad overview of the relationship between religion and politics around the world, especially Christianity and Islam. Religions are considered to constitute not just theologies but also sets of institutions, networks, interests, and sub-cultures. The course’s principal aim is to understand how religion affects politics as an empirical matter, rather than to explore moral dimensions of this relationship. so

*** PLSC 417b / EDST 282b, 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 110 Foundations in Education Studies recommended. WR, SO

*** PLSC 431a or b / GBLB 289a or b / HIST 245Ja or b, War and Peace in Northern Ireland** Bonnie Weir

Examination of theoretical and empirical literature in response to questions about the insurgency and uneasy peace in Northern Ireland following the peace agreement of 1998 which formally ended the three-decade long civil conflict known widely as The Troubles and was often lauded as the most successful of its kind in modern history. Consideration of how both the conflict and the peace have been messier and arguably more divisive than most outside observers realize. SO

PLSC 432b, Russian Politics and Society Egor Lazarev

This course examines critical issues in Russian politics. We use historical and comparative approaches towards Russian political development. We analyze the transformations of political regime and state-society relations in post-Soviet Russia in comparative perspective. We focus on the political logic of economic reforms, influence of the oligarchs, governance, center-periphery relations, authoritarianism, nationalism, civil society, media, and foreign policy. SO

PLSC 435a / MMES 290a / RLST 290a, Islam Today: Jihad and Fundamentalism

Frank Griffel

Introduction to modern Islam, including some historical background. Case studies of important countries in the contemporary Muslim world, such as Egypt, Iran, Pakistan, and Saudi Arabia. Islam as a reactive force to Western colonialism; the ideals of Shari'a and jihad; violence and self-sacrifice; and Islam as a political ideology. HU

PLSC 437b / ER&M 206b / SOCY 223b, The Politics of Ethnic and National Identity

Maria Jose Hierro

Introduction to the study of ethnic and national identity, their determinants and consequences in comparative perspective. SO

PLSC 438a, Applied Quantitative Research Design Alexander Coppock

This course focuses on applications of observational and experimental quantitative research designs to answer both descriptive and causal questions. We characterize designs using the Model, Inquiry, Data strategy, Answer strategy (MIDA) framework and learn about them through simulation. The work is heavily application-driven: each week's problem set involves describing the ex ante properties of a design and reproducing empirical findings using modern data analysis procedures, i.e., the Tidyverse philosophy and set of packages for R. This skills course is designed for students who intend to conduct quantitative empirical research in the future, either inside or outside the academy. Prerequisite: Any statistics or data science course that teaches ordinary least squares regression at any level is a sufficient prerequisite. Prior experience with R is helpful but not required. QR, SO

*** PLSC 442a / ECON 212a, Introduction to Political Economy** John Roemer

The course is an introduction to important economic ideas: preferences and rationality, Pareto efficiency, economic equilibrium in a capitalist economy, externalities, the role of the state, uncertainty and von Neumann-Morgenstern utility, the principle of insurance, elementary game theory (Nash equilibrium), the median voter theorem, political equilibrium with party competition, distributive justice, equality of opportunity, and Arrow's impossibility theorem. These topics are essential tools for political economists. Prerequisite: One year of calculus or intermediate microeconomics with calculus. SO

*** PLSC 445a / GLBL 244a, The Politics of Fascism** Lauren Young

The subject of this course is fascism: its rise in Europe in the 1930s and deployment during the Second World War as a road map to understanding the resurgence of nationalism and populism in today's political landscape, both in Europe and the United States. The course begins with an examination of the historic debates around fascism, nationalism, populism, and democracy. It then moves geographically through the 1930s and 1940s in Europe, looking specifically at Weimar Germany, Vichy France, the rise of fascism in England in the 1930s, and how fascist ideology was reflected in Italy's colonial ambitions during the Abyssinian War. The course examines fascism and the implementation of racial theory and the example of anti-Semitism as an ideological and political tool. It also looks at the emergence of fascism in visual culture. The second part of the seminar turns to fascist ideology and the realities of today's political world.

We examine the political considerations of building a democratic state, question the compromise between security and the preservation of civil liberties and look at the resurgence of populism and nationalism in Europe and the US. The course concludes by examining the role of globalization in contemporary political discourse. SO

*** PLSC 450b / GLBL 341b, The Geopolitics of Democracy** Lauren Young

The threats to liberal democracy are being widely debated, from the US and Europe to developing nations. In order for democracy to continue to thrive as the cornerstone of Western governance, it must adapt and be relevant to citizens of the 21st century. This course examines our appreciation of what constitutes democracy today and how to apply those understandings to the challenges of the 21st century. Our discussions look at the characteristics of democratic leaders and debate whether America, the bulwark of liberal democracy in the 20th century, is still an exporter of democracy and how that matters in today's world. We then look at how to protect and adapt democratic institutions such as free elections, civil society, dissent, and the free press in the face of a rising wave of populism and nationalism. The course examines how refugee crises from conflict regions and immigration impact democracies and debate the accelerating paradigm shifts of income inequality and technology on democratic institutions. We conclude the course with a discussion of the forms of democratic governance that are meaningful in the 21st century and the practicalities of designing or reforming democratic institutions to confront current challenges. SO

PLSC 452a / EP&E 203a / S&DS 102a, Introduction to Statistics: Political Science

Jonathan Reuning-Scherer

Statistical analysis of politics, elections, and political psychology. Problems presented with reference to a wide array of examples: public opinion, campaign finance, racially motivated crime, and public policy. QR

PLSC 453a / EP&E 209a / S&DS 103a / S&DS 112Ea, Introduction to Statistics: Social Sciences Jonathan Reuning-Scherer

Descriptive and inferential statistics applied to analysis of data from the social sciences. Introduction of concepts and skills for understanding and conducting quantitative research. QR

* **PLSC 454b / EVST 454b, Data Science for Politics and Policy** Fredrik Sävje
Data plays an increasingly important role in policy making and politics. The ability to draw valid conclusions from quantitative information can tilt elections or be the difference between a successful or failed policy. This course teaches how to use tools from statistics, data science, and machine learning to solve problems and challenges faced in policy making and politics. Students learn how data can help people make campaign decisions, detect election fraud, predict election outcomes, and investigate if a policy had the intended effect. Students receive an introduction to statistical programming in R, supervised and unsupervised machine learning, and causal inference. QR, SO

* **PLSC 461b / SAST 242b, India and Pakistan: Democracy, Conflict, and Development** Steven Wilkinson

The variation in democracy, conflict, and development between India and Pakistan since 1947, as well as variation within each country. Management of ethnic and religious conflicts, secularism, secessionist movements in Kashmir and elsewhere, the tension between economic growth and equity, and problems of governance. SO

* **PLSC 463a, Nationalism in the World** Maria Jose Hierro

Nationalism is the most powerful political force in the world. It can explain why countries come together and why countries come apart. It can also explain why people praise and trust those who belong to the nation and despise and distrust those who do not. This course introduces students to the study of nationalist thought and practice. The course first examines the concept of nationalism and other adjacent concepts, and reviews different theoretical approaches to the study of nationalism. From here, the course moves to examine nationalist practices: the origin of the nation, the crafting of a national identity, the practice of inclusion and exclusion, the relationship between nationalism and democracy and nationalism and conflict, nationalism in the postcolonial world and nationalism in the world today. The course examines nationalist thought and practice in different geographic areas and relies on both theoretical and empirical literature from several disciplines (history, economy, sociology, psychology and political science) to understand the power of nationalism in the world today. SO

PLSC 464a, Immigration, Integration, and Multiculturalism in the West Salma Mousa

Do immigrants integrate? What determines the attitudes of native-born communities toward immigrants? Are immigrants good or bad for local economies? Does the presence of immigrants fuel far-right movements? Which policy tools encourage integration, and which can spur backlash? These are some of the questions we investigate together by reviewing the evidence base on immigration, integration, and multiculturalism. This course emphasizes research design and statistical methods for moving beyond correlations and toward understanding the causal effects of immigration and immigration policy. SO

*** PLSC 466a / HIST 268Ja / JDST 351a / RLST 324a, 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 468b, Machine Learning Tools For Political Analysis** John Henderson

This course covers a wide array of machine learning techniques that aim to improve our understanding of political phenomena through better measurement, estimation, and inference. Topics include measurement, reliability and error concepts, text and web scraping, supervised and unsupervised learning, Bayesian inference, cluster and topic modeling, ideal point scaling, and some advanced topics in statistical inference. The aim of the course is to provide students with a host of practical tools that can be used to evaluate and replicate other research, as well as to help students address methodological issues arising in their own work. Two terms of probability, statistics or data science courses (e.g. S&DS 100, 110, 123, 220, 230; PLSC 454, 500, 503, 504; ECON 136; EP&E 203, 209, or equivalents) are strongly recommended. Working knowledge of a statistical programming language (e.g., R, python, stata) is required. QR, SO

*** PLSC 471a, Individual Reading for Majors** David Simon

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 480a or b, One-Term Senior Essay** David Simon

For seniors writing the senior essay who do not wish, or are unable, to write the essay in a department seminar. Students must receive the prior agreement of a member of the department who will serve as the senior essay adviser, and must arrange to meet with that adviser on a regular basis throughout the term.

*** PLSC 490a or b, The Senior Colloquium** Staff

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 writing a yearlong senior essay.

Portuguese (PORT)

PORT 110a, Elementary Portuguese I Staff

Basic vocabulary and fundamentals of grammar through practice in speaking, reading, and writing, with stress on audio-lingual proficiency. Introduces Brazilian and Portuguese culture and civilization. L1 RP 1½ Course cr

PORT 120b, Elementary Portuguese II Staff

Continuation of PORT 110. To be followed by PORT 130. Prerequisite: PORT 110. L2 1½ Course cr

PORT 130a, Intermediate Portuguese I Staff

Contemporary and colloquial usage of Portuguese in the spoken and written language of Brazil. Grammar review and writing practice. Readings on Brazilian society and history are used to build vocabulary. Exercises develop students' oral command of the language. L3 RP 1½ Course cr

PORT 140b, Intermediate Portuguese II: Portuguese Through the Arts Staff

Continuation of PORT 130. Grammar review, conversation, cultural topics, and readings from Brazilian literature. Concentration on varieties of artistic and cultural expression. Counts for the major in Portuguese. Prerequisite: PORT 130. L4 1½ Course cr

PORT 151a, Re-acting: Drama in Portuguese Giseli Tordin

This course introduces more diverse and sophisticated linguistic structures based on the studying of a variety of works of theater plays of the Portuguese-speaking world, mostly from Brazil. Learning Portuguese through drama allows for a richer understanding of content, historical periods, different gender and social-class perspectives, along with linguistic structures and lexical choices in a variety of contexts. In addition, we study how a variety of authors designed different destinies for the underrepresentation of women and subvert a set of beliefs insofar as to reinstate women center-stage, among other themes. The practical component to this course involves active participation in a wide range of tasks and activities, with focus on practices with theatrical readings, production of scripts, podcasts, clips, and adaptation of some short stories into plays. Also, students are invited to develop a theatrical reading along with the elements of scenography to constitute its production, and write a digital article about this experience to be published at our magazine: *Revista dos Estudantes de Português da Yale*. Prerequisite: PORT 140 or equivalent. L5

* **PORT 300b, The Short Story: Major Authors** Kenneth David Jackson

Close reading of modern short stories by major authors writing in Portuguese, with an emphasis on Brazilian literature. Dominant critical and thematic currents; analysis of social forces. Prerequisite: PORT 140 or equivalent. L5, HU

* **PORT 341a / ER&M 441a / LITR 335a, Crossing Cultures in the Portuguese Diaspora** Kenneth David Jackson

Inquiry into the first encounters of the Portuguese with the people and cultures of Africa, Asia, and Brazil after the voyage of Vasco da Gama (1497-99). Topics include acculturation, contact peoples and languages, creolistics and hybrid cultures, music, plants and cuisines, and the theory of space in between cultures. Readings include the epic, histories, memoirs, and travel literature, and the "Cannibal Manifesto." Reading knowledge of Portuguese suggested. WR, HU TR

* **PORT 392b / LAST 392b / LITR 296b, Brazil's Cannibal Modernism: From Modern Art Week to Antropofagia** Kenneth David Jackson

A study of Brazilian modernism in literature and the arts, centered on São Paulo's "Modern Art Week" of 1922 and the "Cannibal Manifesto" from the perspective of major figures and works, and transatlantic exchanges with figures from the European avant-gardes. Includes analysis of *antropofagia* as a post-colonial strategy. Reading knowledge of French and Portuguese helpful but not required. WR, HU TR

* **PORT 394a / LAST 394a / LITR 294a, World Cities and Narratives** Kenneth David Jackson

Study of world cities and selected narratives that describe, belong to, or represent them. Topics range from the rise of the urban novel in European capitals to the postcolonial fictional worlds of major Portuguese, Brazilian, and Lusophone cities. Conducted in English. WR, HU TR

Psychology (PSYC)

PSYC 110a or b, Introduction to Psychology Staff

A survey of major psychological approaches to the biological, cognitive, and social bases of behavior. SO

PSYC 116b / CGSC 216b / LING 116b, Cognitive Science of Language Robert Frank

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 125a / CHLD 125a / EDST 125a, Child Development** Carla Horwitz and Ann Close

The reading of selected material with supervised participant-observer experience in infant programs, a day-care and kindergarten center, or a family day-care program. Regularly scheduled seminar discussions emphasize both theory and practice. An assumption of the course is that it is not possible to understand children – their behavior and development – without understanding their parents and the relationship between child and parents. The focus is on infancy as well as early childhood. Enrollment limited to juniors and seniors. WR, SO

PSYC 126a, Attraction and Relationships Jennifer Hirsch

Theory and empirical research on the antecedents and consequences of attraction, and on intra- and interpersonal processes that either facilitate or interfere with the formation and maintenance of close relationships. Methodological bases for rigorous study of these topics. SO

* **PSYC 127b / CHLD 127b / EDST 127b, Theory and Practice of Early Childhood Education** Carla Horwitz

Development of curricula and responsive educational environments for young children – in light of current research and child development theory. The course focuses on critical analysis of programs for young children and the ways in which political context

contributes to the practice of education. Regularly scheduled seminar discussions emphasize both theory and practice. Supervised participant-observer experience in an early childhood classroom. Components of the course include behavior and development, planning, assessment and standards, culture, teacher preparation, and working with families. Priority given to seniors, juniors and Ed Studies students. WR, SO RP

*** PSYC 128b / CHLD 128b / EDST 128b, Language, Literacy, and Play** Carla Horwitz and Ann Close

The complicated role of play in the development of language and literacy skills among preschool-aged children. Topics include social-emotional, cross-cultural, cognitive, and communicative aspects of play. WR, SO RP

PSYC 130a / CGSC 110a, 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 140a / EDST 140a, 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 150b / EDST 160b, Social Psychology Jennifer Hirsch

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 157b, Psychology and the Good Life Laurie Santos

Psychological insights into how to live a better life and build a better world. Topics include scientifically-validated strategies for becoming happier, achieving behavior change, handling cognitive biases, and picking a meaningful career. Discussion of psychological insights into protecting the environment, improving education, promoting charitable giving, and inspiring healthier lifestyles. Students will practice strategies taught in the course to promote their own positive behavior change. SO

PSYC 160b / NSCI 160b, The Human Brain Gregory McCarthy

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 161b / NSCI 161b, Drugs, Brain, and Behavior Hedy Kober

An introduction to psychoactive drugs and their effects on both brain and behavior. Review of pharmacological and brain mechanisms of different classes of legal, illegal, and medicinal drugs, including alcohol, caffeine, tobacco, stimulants, depressants, antidepressants, and hallucinogens. Individual drugs' pharmacokinetics, mechanisms of action, dosing, routes of administration, and patterns and effects of use and misuse. Some attention to substance use disorders/addictions, prevention, and treatment. SC

PSYC 179a, 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, causal learning, logical reasoning, problem solving, creativity, intelligence, moral reasoning, and language and thought. SO

PSYC 180a / EDST 180a, Clinical Psychology Jutta Joormann

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

PSYC 182b / CGSC 282b / PHIL 182b, Perspectives on Human Nature Joshua Knobe

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

PSYC 200a or b, Statistics Staff

Measures of central tendency, variability, association, and the application of probability concepts in determining the significance of research findings. QR

*** PSYC 235a 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 258b / NSCI 258b, Computational Methods in Human Neuroscience** Nick Turk-Browne

This course provides training on how to use computational science for the advanced analysis of brain imaging data, primarily from functional magnetic resonance imaging (fMRI). Topics include scientific programming, high-performance computing, machine learning, network/graph analysis, real-time neurofeedback, nonparametric statistics, and functional alignment. Prerequisites: CPSC 100, CPSC 112 or other course involving terminal commands and programming (Python preferred); course in statistics and/or data science; PSYC 160 or other human neuroscience course; or permission of instructor. QR, SC

*** PSYC 270a / NSCI 270a, 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 312a / ER&M 412a, Native American 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 316b / NSCI 360b, Clinical Neuroscience Tyrone Cannon

The biological bases of psychopathology, with attention to the interplay of biological and psychological factors. Research and theory regarding the role of biological influences such as genetics, neuronal physiology and signaling, and psychopharmacology in the major classes of mental disorders. Discussion of mood and anxiety disorders, schizophrenia, addictions, personality disorders, eating disorders, and autism. SC

PSYC 317a / EDST 237a / LING 217a, 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

PSYC 318a / LING 220a, General Phonetics Jason Shaw

Investigation of possible ways to describe the speech sounds of human languages. Acoustics and physiology of speech; computer synthesis of speech; practical exercises in producing and transcribing sounds. SO

PSYC 329b / LING 146b / WGSS 145b, 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. SO

PSYC 331b / LING 231b, 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. SO

*** PSYC 334a / CHLD 334a, Developmental Psychopathology** Fred Volkmar, Eli Lebowitz, and Denis Sukhodolsky

Study of developmental psychopathology during childhood and adolescence, team taught by a child psychiatrist and three psychologists. Topics include: aspects of normal development, assessment methods, clinical disorders, treatment, and legal and social policy issues. Review of normative development, followed by discussion of theoretical approaches to understanding developmental aspects of common mental health conditions in childhood. Attention to treatment models as well as relevant issues of culture and ethnicity in the expression of psychopathology. Prerequisites: PSYC 130, 140, 180, or equivalent, or with permission of instructor.

PSYC 335b / NSCI 340b, 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 336a / AFAM 118a / ER&M 249a / SOCY 153a, Is That Racist?: Theory and Methods for Diagnosing and Demonstrating Racism Phillip Atiba Goff

How do we know when something is racist? And how do we prove it to those who are skeptical? This course is designed to allow students to go beyond armchair pontificating about racism by exploring a broad range of ways social theorists have defined the term and methods they have used to demonstrate it. Together, we have the opportunity to read, critique, and synthesize scholarship from across disciplines, with the goal of refining our own definition of the term. To accomplish this, we examine the stakes of calling something racist, who benefits and who suffers from a given definition, and how racism functions across contexts (mostly) within the United States. We also learn about popular methods for demonstrating that an idea, feeling, behavior, person, or institution is racist and evaluate how evidence about racism (or lack thereof) can obscure a diagnosis of racism—or lead to an erroneous one. Throughout the course, we take opportunities to translate the theoretical and methodological lessons we learn to the world we live in today, from popular culture to dinner table conversations. While there are no statistical prerequisites, students will be asked to think about the logic of statistical analysis and should be comfortable reasoning about numbers. HU, SO

PSYC 352a / CGSC 352a / NSCI 352a, Arrested or Adaptive Development of the Adolescent Brain BJ Casey

Study of empirical and theoretical accounts of adolescent-specific changes in the brain and in behavior that relate to the development of self control. Discussions will focus on adaptive and arrested adolescent brain development in the context of relevant legal, social, and health policy issues. Prerequisites: PSYC 110, PSYC 160. SC

PSYC 376b / NSCI 341b, Learning and Memory Samuel McDougle

The basic facts, general principles, and theories that describe how higher animals, from mice to humans, are changed by their experiences. The historically separate fields of learning and memory research desegregated under a neuroscientific perspective that recognizes the evolutionary continuity among higher animals. Prerequisite: Introductory courses in biology and psychology, or permission of instructor. SC, SO

*** PSYC 408b, 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 419b / CGSC 419b / NSCI 419b, Topics in Brain Development, Law, and Policy** BJ Casey

Healthy development is a fundamental right of the individual, regardless of race, ethnicity, socioeconomic status, or gender. Youth require special protections of their rights due to vulnerabilities related to their physical and mental immaturity. These

rights include, not only protections, but opportunities for building the cognitive, emotional, and social skills necessary for becoming a healthy adult and a contributing member of society. This seminar examines the extent to which legal policies and practices in the treatment of youths are consistent with scientific knowledge on psychological and brain development. Each class discusses one or more legal cases highlighted in the context of brain and psychological science and current laws and policies. Prerequisite: PSYC 110 and PSYC 160 preferred. SO

*** PSYC 420b / CGSC 420b / NSCI 440b, Topics in Clinical Neuroscience** Avram Holmes

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 427b / CGSC 427b, The Rise and Fall of Wonder: When Early Passions for Exploration and Discovery Decay with Age** Frank Keil

Research on children's minds reveals early emerging abilities that help explain the developmental origins and early growth of wonder. We consider wonder as the joy of exploration and discovery. Preschoolers and even infants are driven to learn not just facts and statistics, but also underlying causal patterns that are at the heart of many sciences. They learn not just as individual but also as members of knowledge communities and, early on, they sense how to "harvest" knowledge from these communities. Yet, those joyous moments of discovery and exploration often fade as children grow older and cease to wonder. We explore how this decline occurs and its consequences. When people stop wondering, they fail to expand their grasps of the world and become ever more vulnerable to misunderstanding and manipulation by others. We examine possible ways to reverse the decline. Prerequisite: PSYC 110 or CGSC 110. SO

*** PSYC 428a / NSCI 442a, Neuroscience of Decision-Making** Molly Crockett

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 431a, Human Skill Learning** Samuel McDougle

Humans possess a remarkable ability to learn new skills, and retain memories for those skills throughout their life span (e.g., learning to ride a bicycle). The ease with which humans acquire and sharpen skills belies the complexity involved in selecting and executing the correct actions in a given situation. This course considers both foundational and contemporary psychology and neuroscience research regarding skill learning, with an emphasis on motor and reinforcement learning. The overall goal of the course is to gain an understanding of the different cognitive processes and algorithms that underlie skill acquisition. Prerequisite: PSYC 110. Recommended: PSYC 130, PSYC 160, PSYC 335, PSYC 376.

* **PSYC 432b / NSCI 455b, Under Pressure: The Psychology of Stress** Dylan Gee

Stress is pervasive in everyday life. Why do humans experience stress, and what causes stress in today's society? How does stress affect the ways we think, feel, and behave? Why are some people particularly susceptible to the effects of stress on mental and physical health? What factors can buffer against the consequences of stress, and how can we leverage stress management techniques to effectively cope with stress? This course draws from psychological, neurobiological, social, developmental, and clinical perspectives to address these questions. In addition to an in-depth study of theory, research, and intervention in the field of stress, this seminar is designed to translate scientific advances to help students learn how to more effectively manage stress in their own lives. Priority given to juniors and 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 434b, The Psychology of Changing One's Mind** Melissa Ferguson

When and how do we change our minds? We are constantly learning information about other individuals, groups, objects, ideas, and so on, but this new information does not always influence what we think and how we feel. What determines when we update our beliefs and feelings? This course reviews cutting-edge psychological science to answer this question, with special attention to social and cognitive research on how we change our minds about other individuals and groups. Prerequisite: One course in social or cognitive psychology. SO

* **PSYC 437b / CGSC 437b, Minds, Brains, and Machines** Julian Jara-Ettinger

Exploration of the implications that the brain is a kind of computer that gives rise to the mind. Readings combine classical and cutting-edge research in psychology, philosophy, and artificial intelligence. SO RP

* **PSYC 438a / NSCI 441a, Computational Models of Human Behavior** Robb Rutledge

Why do we do the things we do? How do we adapt to changes in the environment? And how does our happiness depend on our choices and what happens to us? How can computational models help us to gain new insights into psychological processes? The goal of this course is to use computational models to understand human behavior and its relationship to our emotions. Data is collected in a variety of tasks including new experiments designed by students, and is analyzed using computational models. CPSC 112 or other course involving programming (e.g., C++, Java, Python, Matlab), or permission of instructor. SC

* **PSYC 439a / CGSC 439a, The Psychology of Social Construction** Yarrow Dunham
 We live in a world replete with “forgeries that become genuine”: pieces of paper that become money, words that become promises, lines in the sand that become borders. Nearly every aspect of our lives is shaped and constrained by these kinds of socially constructed entities, things as real as mountains but far more mysterious. How do such entities come to be, and how do (and how should) we understand them? How are they made and how can they be contested when they go astray? Answering these questions requires ranging across diverse literatures beginning with psychology but including philosophy, anthropology, economics, and game theory. Prerequisite: PSYC 110 or CGSC 110. SO

* **PSYC 449a / NSCI 449a, 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 479a / NSCI 479a, Computational Basis of Seeing and Thinking** Ilker Yildirim
 The goal of this seminar is to discuss the computational basis of seeing and thinking in the mind and brain. We are especially concerned with this question of how perception gets us to cognition: How is it that perception transforms raw, unprocessed, unorganized, incoming sensory signals arising from our physical environments – for example, the light that bounces off surfaces and arrives at your retina, raw audio waves hitting your ears, or the vibro-tactile sensations you feel at your fingertips when you touch a surface – into things like objects and people, into things that we can think about? We somewhat prioritize the field of scene perception, where many fundamental questions about the nature of seeing and aspects of cognition arise prominently, and much of those questions remain open to this date. We draw upon readings and classroom discussions to find out where the literature stands, including behavioral, neural, and computational studies, all in the context of searching for a mechanistic, functional account of how the brain produces percepts and thoughts about objects, scenes, and people. SO

* **PSYC 493a or b, Directed Research** Jutta Joormann
 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 seventh calendar day from the beginning of the term. 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 requirement.

* **PSYC 495a or b, Research Topics** Jutta Joormann

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 seventh calendar day from the beginning of the term. 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 be repeated for credit. May not be used for the Psychology senior requirement.

½ Course cr

* **PSYC 499a or b, Senior Essay** Jutta Joormann

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 to the director of undergraduate studies by the seventh calendar day from the beginning of the term. 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)

Religious Studies (RLST)

* **RLST 113b, The Prophetic Tradition and Democracy** Staff

This course explores and evaluates the viability, and perhaps necessity, of prophetic political action in the context of liberal democracy in general and contemporary America in particular. Prophecy offends the canons of liberal reason and reasonableness: Where liberal theory's ideal citizen engages their fellows through respectfully deliberative, rational dialogue on the basis of presumed equal standing and by appeal to shared premises, the prophet seems to arrogate to themselves an authority they do not take their audience to possess, uncivilly condemning their detractors while demanding societal transformation in light of a truth to which they purport to enjoy privileged access. Our question is whether the offense of prophecy can find a legitimate home in liberal democracy and whether liberal democracy can be safe for the oppressed without it. HU

* **RLST 114b, What's the Matter (with Religion)?** Stephen Davis

We (and everything around us) matter and are made of matter. When it comes to common cultural conceptions, however, religion is all too often conceived of as a purely spiritual, transcendent, and supernatural domain. This course challenges those assumptions by drawing on recent approaches that emphasize and also interrogate the power and agency of things, whether human or non-human, organic or inorganic, tangible or intangible. Part one of the course equips students with key theoretical frameworks, including thing theory, vital materialism, animacies,

entanglements, symmetrical archaeology, and affect and emotion. Part two consists of deep dives into selected case studies, organized under the following thematic headings: aniconism and the immaterial, materializations of ritual practice (oracles, magic, and fetishes), apparitions and hauntings, movements and migrations, consumption and consumerism, illness and contagion, and ecology and the environment. As we traverse these topics, we encounter materialities ranging from ancient Greek rock art, Roman oracle shrines, and recipes for magical spells and visions of saints in Egypt, to devotional items confiscated from undocumented immigrants, the marketing of religion by Goldman Sachs and Kanye West, viral epidemics, and “natural” disasters. Students come away from this seminar better able to recognize and act upon what matters in the world. HU

RLST 115b / AMST 116b, How to Build an American Religion Kathryn Lofton
How communities can be organized through code, charisma, ritual, and cosmology. Topics include strategies for concretizing utopia and establishing communal principles, expanding audiences, and specifying creed. This course serves as an introduction to religion through theoretical readings and specific examples drawn from the transnational American scene, past and present. Discussion of particular leaders, sects, practices, and media will offer insights into how ideas organize societies and individuals establish themselves as icons. Students adapt strategies taught in the course in order to practice their own capacity to foster social movements, develop and critique brands, and consider the relationship between religion, politics, and economy. HU

* **RLST 119b / WGSS 319b, The Animal and Religion** Staff
This interdisciplinary seminar analyzes key texts formulating the question of the (non)human and animal by examining the recent proliferation of work on animality, not only in religious studies, but also in Black studies, gender studies, philosophy, and anthropology. The course critically examines key accounts of religion and the animal in relation to colonialism, capitalism, race, gender, sexuality, and class. Questions explored include: What does animal religion or religious animality look like? How is the category of religion understood with respect to the nonhuman or less-than-human? What is the relationship of conceptions of the (non)human in modernity to the slave trade and colonialism? How do notions of personhood, spirituality, dominion, evolution, empathy, and cosmology relate to the (non)human and animal? HU

* **RLST 121a / EALL 296a / EAST 391a, Religion and Culture in Korea** Hwansoo Kim
Introduction to Shamanism, Buddhism, Confucianism, Daoism, Christianity, and new religions in Korea from ancient times to the present. Examination of religious traditions in close relationships with social, economic, political, and cultural environments in Korean society. Examination of religious tensions, philosophical arguments, and ethical issues that indigenous and foreign religions in Korea have engaged throughout history to maximize their influence in Korean society. HU

* **RLST 128a / ANTH 128a / CLCV 307a, Emotion and Identity in Antiquity** Daniel Eastman
“You are what you feel.” But how much control do we have over how we feel? Does – or can – everyone experience the world through the same categories of feeling, or “emotions”? To what extent are people’s emotional options constrained or scripted by aspects of identity such as religion, gender, class, and language? This seminar explores the connections between emotions and identity in the context of the ancient Mediterranean world, with reference to modern theories of emotion along the way.

Topics covered include (1) ancient theories of what emotions are and how they relate to the "self"; (2) norms concerning which emotions are "proper" and for whom (including humans, animals, and gods; women and men; and "pagans," Jews, and Christians); and (3) practical methods used to cultivate certain emotions over others.

HU

*** RLST 129a, Imagining Utopia** Staff

This course surveys different constructions of utopias in religion, literature, and political thought from Plato's *Republic* to Star Trek and beyond. Topics include: Jewish and Christian apocalypticism, utopian socialism, Afrofuturism, and the development of utopian literature. Students critically examine the utility and limits of utopianism while creatively planning and describing their own utopia. HU

RLST 141b / AFST 112b / ARCG 222b / NELC 112b, Egyptian Religion through the Ages John Darnell

Diachronic approach to topics in Egyptian religion. Religious architecture, evidence for protodynastic cults, foreigners in Egyptian religious celebrations, music and vocal expression in Egyptian religion, Re and Osiris, the Amarna interlude and the Ramesside solar religion, and the goddess of the eye of the sun. Readings in translation.

HU

RLST 145a / HUMS 133a / JDST 110a, The Bible Christine Hayes

The writings common to both Jewish and Christian scripture examined as diverse and often conflicting expressions of the religious life and thought of ancient Israel. The works' cultural and historical setting in the ancient Near East; the interpretive history of selected passages influential in Western culture. Introduction to a wide range of critical and literary approaches to biblical studies. Students view course lectures, which survey the entire Bible, on line; class time focuses on specific biblical passages and their subsequent interpretation in Jewish and Christian culture. HU

RLST 148a / ER&M 219a / HIST 219a / JDST 200a / MMES 149a, Jewish History and Thought to 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

RLST 160a / HIST 280a / ITAL 315a, 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

*** RLST 175b / EAST 431b, North Korea and Religion** Hwansoo Kim

Ever since the establishment of the Democratic People's Republic of Korea (DPRK) in 1948 and the Korean War (1950–1953), North Korea has been depicted by the media as a reclusive, oppressive, and military country, its leaders as the worst dictators, and its people as brainwashed, tortured, and starving to death. The still ongoing

Cold War discourse, intensified by the North Korea's recent secret nuclear weapons program, furthers these negative images, and outsiders have passively internalized these images. However, these simplistic characterizations prevent one from gaining a balanced understanding of and insight into North Korea and its people on the ground. Topics other than political, military, and security issues are rarely given attention. On the whole, even though North Korea's land area is larger than South Korea and its population of 25 million accounts for a third of all Koreans, North Korea has been neglected in the scholarly discussion of Korean culture. This class tries to make sense of North Korea in a more comprehensive way by integrating the political and economic with social, cultural, and religious dimensions. In order to accomplish this objective, students examine leadership, religious (especially cultic) aspects of the North Korean Juche ideology, the daily lives of its citizens, religious traditions, the Korean War, nuclear development and missiles, North Korean defectors and refugees, human rights, Christian missionary organizations, and unification, among others. Throughout, the course places North Korean issues in the East Asian and global context. The course draws upon recent scholarly books, articles, journals, interviews with North Korean defectors, travelogues, media publications, and visual materials. so

*** RLST 192b / JDST 297b, Religion, Ethnicity, and Identity in American Jewish History** Elli Stern

An exploration of how Jews in America negotiated, and renegotiated, religion and ethnicity to forge a hyphenated American identity. Topics include the impact of Protestant domination, immigrant experiences and legacies, the role of discrimination, and self-presentation and representation by others. Each term prospective junior History majors should apply for seminars for the following term using the online junior seminar preregistration site. Preregistration begins after midterm in the fall for seminars offered in the spring term, and after spring recess for seminars offered in the subsequent fall term. In September and in January, application for admission should be made directly to the instructors of the seminars, who will admit students to remaining vacancies in their seminars. Priority is given to applications from juniors, then seniors, majoring in History, but applications are also accepted from qualified sophomores and from students majoring in other disciplines or programs. HU

*** RLST 210a / PHIL 206a, Nietzsche, Religion, History** Nancy Levene

An exploration of Nietzsche's concepts of religion and history and of his thinking in a broad historical arc up to the present. Course material includes texts by Nietzsche and selections from philosophies, theologies, and works of art that invite dialogue with his ideas. HU

*** RLST 214a / HIST 248Ja / JDST 293a, Introduction to Modern Jewish Thought** Elli Stern

An overview of Jewish philosophical trends, movements, and thinkers from the seventeenth century to the twenty-first. Topics include enlightenment, historicism, socialism, secularism, religious radicalism, and Zionism. HU

*** RLST 215a / AMST 356a, Celebrity, Politics, Power** Kathryn Lofton

This course uses celebrity to think about American political power. Informed by American studies, gender studies, and religious studies, the course considers celebrity a way to talk about how popularity is an embodied and spiritualized appraisal. The bibliography on celebrity and politics is not a robust one, despite the fact that winning elections requires popularity and in the last twenty years of American politics some

conscientiousness of the skill sets celebrities mastered seems a precondition for electoral success. The course assembles a range of scholarly and archival resources to think about what it means to achieve celebrity, and how it is a political form of public life. Of particular interest is how to think about the construction of magic and charisma, and how those very idioms often contribute to accusations of mesmerism and manipulation. Written assignments focus students on developing celebrity as an applied knowledge for social media development and political progress. HU

*** RLST 225a / EAST 406a / EAST 506a / RLST 628a, Paradise in Buddhism: Pure Land Traditions** Staff

Pure Land Buddhism is a tradition with roots in India that developed most extensively in East Asia. Unlike other forms of Buddhism, it centers on a paradise motif and is largely devotional in character. It arises from scriptural stories about a transcendent Buddha named Amida who vows to bring all living beings to enlightenment via an other-worldly realm known as the Pure Land. The seminar examines this tradition historically against the backdrop of Buddhism in general, focusing on the Pure Land sutras and the unfolding of Pure Land Buddhism in Japan. Among the goals of the course is to develop familiarity with the structure of the sutras and with classical Buddhology, the core concepts and strategies of Buddhist doctrine and story-making. It also explores the teachings of several celebrated Japanese Buddhists, the portrayal of women in texts and religious practices, and the demythologization of Pure Land and Amida in the modern period. HU

*** RLST 231a / HIST 226Ja / JDST 370a, Jews and Christians in the Formation of Europe, 500-1500** Ivan Marcus

This seminar studies topics related to the interactions between medieval Jewish communities and Christian leaders and social groups. Political, social, economic, religious, and material features of medieval Jewish-Christian encounters are discussed. WR, HU RP

*** RLST 233a / ENGL 346a / HUMS 253a, 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 256a / FILM 336a / MMES 311a, Social Change in Middle East Cinemas** Staff

This course invites students to explore how modern aesthetic forms such as cinemas from the Middle East and North Africa critique rigid social realities and imagine modern social experiences, thereby pushing boundaries towards social change. By chronologically examining Arabic, Turkish, Hebrew, and Persian films in different historical periods, we will explore how film as art reveals the nature of social myth and the role public intellectuals play in perpetuating or challenging that myth. In addition to weekly film screenings (with English subtitles), course material includes short readings on the modern history of the region, history of film production, and analysis of film as art. By the end of this course, students will learn about the history of filmmaking in the MENA region, the different questions (religion, class, language, gender, ethnicity, race, nationalism and colonialism) influencing the production and reception of film, the challenges facing the filmmaker as an artist and producer and more importantly how these challenges impact the imagination of social change on the screen.

RLST 262a / ARCH 272a / HSAR 150a, Introduction to the History of Art: Art and Architecture of the Sacred Jacqueline Jung

A wide-ranging, cross-temporal exploration of religious images, objects, and architecture in diverse cultures, from ancient Mesopotamia to modern Manhattan. Buddhist, Christian, Hindu, Jewish, Muslim, and various polytheistic traditions are represented. Thematic threads include the human body; transformations of nature; death, memory, and afterlife; sacred kingship and other forms of political engagement; practices of concealment and revelation; images as embodiments of the divine; the framing and staging of ritual through architecture. HU

RLST 290a / MMES 290a / PLSC 435a, Islam Today: Jihad and Fundamentalism Frank Griffel

Introduction to modern Islam, including some historical background. Case studies of important countries in the contemporary Muslim world, such as Egypt, Iran, Pakistan, and Saudi Arabia. Islam as a reactive force to Western colonialism; the ideals of Shari'a and jihad; violence and self-sacrifice; and Islam as a political ideology. HU

*** RLST 324a / HIST 268Ja / JDST 351a / PLSC 466a, 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 359a / EAST 404a / HIST 305Ja, Faith in Law in East Asia: Beginnings to 1800** Staff

This course investigates law in East Asia from ancient times to 1800 from the perspective of belief. We debate treatises, codes, cases, and cultural products from across East Asia's legal traditions, tracing the lives they took on. We work to understand firsthand law in its diverse contexts. More fundamentally, we consider the many ways in which people formed beliefs about what "law" might be or do. We examine the philosophical and faith traditions – and the hopes and fears – through which law was articulated, justified, realized, and then immediately contested. Throughout, we ask: What does it mean to invest law with one's faith? How much of one's belief is law? How much does law depend on one's belief? What gave people pause about this over time? You develop your own answers, with an eye toward how all of this has been understood, misunderstood, and appropriated across cultures and time. So the next time you hear an analyst or government official explain something in East Asia as rooted in "a Confucian disdain for law," or "Japanese 'Justice,'" (feat. in NYT) you will be equipped to strike up a conversation about just how they arrived at that belief. HU

* **RLST 408b / JDST 400b, Interpreting the Bible in Antiquity: Case Studies**

Christine Hayes

Examines the rich and polyphonic tradition of interpretation of two biblical narratives that were classical loci of Jewish-Christian polemic. Beginning with inner-bible exegesis, and continuing with ancient translations, Second Temple and Hellenistic period literature, early Christian sources, and finally classical rabbinic texts, this course explores the interpretative techniques and rhetorical strategies of ancient readers (especially *midrash* and allegory) and considers the way sacred texts have been employed to stake out competing intellectual and cultural claims. Prerequisite: reading proficiency in Hebrew. HU

* **RLST 420a, Introduction to Syriac Christianity** Maria Doerfler

This seminar aims to introduce students to the literary, historical, and theological tradition of Syriac Christianity and the developing field of Syriac Christian studies. In this vein, students encounter a number of the tradition's key authors; learn to locate its development in the context of different imperial cultures and religious interlocutors, including Judaism and Islam; and explore topics at the vanguard of current scholarship, including distinctive approaches to asceticism, ritual, and historiography. In addition to weekly meetings, the seminar further requires attendance for three special sessions: a visit to the Beinecke Rare Books & Manuscripts Library and its considerable Syriac manuscript holdings; a visit to the Yale University Art Gallery and its collection of relevant artefacts and coins; and an introduction to the use of digital humanities in Syriac Studies through the Yale Digital Dura-Europos Archive (YDEA). Permission of Instructor is required. HU

* **RLST 428b / ANTH 428b / PHIL 493b, Neighbors and Others** Nancy Levene

This course is an interdisciplinary investigation of concepts and stories of family, community, borders, ethics, love, and antagonism. Otherwise put, it concerns the struggles of life with others – the logic, art, ethnography, and psychology of those struggles. The starting point is a complex of ideas at the center of religions, which are given to differentiating "us" from "them" while also identifying values such as the love of the neighbor that are to override all differences. But religion is only one avenue into the motif of the neighbor, a fraught term of both proximity and distance, a contested term and practice trailing in its wake lovers, enemies, kin, gods, and strangers. Who is my neighbor? What is this to ask and what does the question ask of us? Course material includes philosophy, anthropology, psychology, fiction, and film. HU

* **RLST 429b, Phenomenology** Noreen Khawaja

In-depth introduction to phenomenology as a theory of what is and as a method for studying it. Key figures in the history of phenomenology, emphasizing connections to social theory, aesthetics, and religion. Readings from Merleau-Ponty, Heidegger, Fanon, Husserl, Ahmed, Barad, and others. HU

* **RLST 430a / PHIL 429a / SAST 470a and SAST 670a, Indian Philosophy in Sanskrit Literature** Aleksandar Uskokov

In this course we focus on issues of philosophical significance in Sanskrit literature of "non-standard" philosophical genres, i.e., other than the treatise and the commentary. Specifically we read from canonical Hindu texts such as the Upani#ads, Mahābhāra, Rāmāya#a, Bhāgavata Purā#a, Bhagavad-gītā, and Yogavāsi##ha; the classical genres of drama and praise poetry; and hagiographical literature, all in English translation. Attention is paid not only to substance but also form. The selection of philosophical

problems includes philosophy of mind and personal identity; allegory; the ethics of non-violence; philosophy, politics, and religious pluralism; the highest good; theodicy; philosophical debate; etc. HU

* **RLST 435a / AFAM 402a, Black Religions in Slavery and Freedom** Nicole Turner

This course explores how enslaved and free black people created and sustained religious communities in the United States during the eras of slavery and freedom. It explores the resonances of African traditions, the role of conjure, Islam and Christianity in sustaining Black people through slavery and the transformations that developed after emancipation. The course challenges the paradigm of black religion as always pointing toward freedom while exploring how the transition in status from enslaved to free was reflected in and influenced by black religious practices and communities. This course explores the religious communities of the “slave quarters,” underground railroad, independent black churches on the political landscape of freedom through the end of the 19th century. This course aims to provide participants with a deeper exploration of the developments within the period from the 19th century through 1915 and the advent of Jim Crow and U.S. imperialism.

* **RLST 445a / MMES 490a / NELC 490a, Introduction to Arabic and Islamic Studies**

Frank Griffel

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.

* **RLST 485a, African American Religious History** Nicole Turner

A seminar focused on the history of African American religions. African American religions are dynamic and multifaceted. Oft depicted as sources of black resilience and emblems of black resistance, African American religions have also been criticized for marginalizing and racializing black people, as well as encoding archaic gender paradigms and reinforcing class divisions. This course explores the ways histories of African American religions have produced these various interpretive frames. Questions that animate the course include: What role have African American religions played in African American life? How have scholars studied the history of African American religions and ultimately shaped the discourse about African American religious life, and by extension African American history? This course resolves these questions through an examination and production of historical writing. Intended for advanced students pursuing specific senior-level research. HU

* **RLST 486a / EALL 221a, Introduction to Chinese Buddhist Literature** Eric Greene

This class is an introduction to Chinese Buddhist literature. Although written in classical Chinese, Buddhist texts in China were written in a particular idiom that was much influenced by the Indian languages and which can be difficult to understand without special training. This class introduces students who already have some reading ability in literary Chinese to this idiom and the tools and background knowledge needed to read and understand Chinese Buddhist literature. We read a series of selections of some of the most influential Chinese Buddhist texts from various genres including canonical scriptures, apocryphal scriptures, monastic law, doctrinal treatises, and hagiography. Secondary readings introduce the basic ideas of Indian and Chinese Buddhist thought to the extent necessary for understanding our readings. Prerequisite:

CHNS 171 (Literary Chinese II) or equivalent, or permission of the instructor. Students of Japanese or Korean literature who can read basic *kanbun* or *gugyeol* are also welcome to enroll; no knowledge of modern, spoken Chinese is required. L5, HU

*** RLST 488a, Individual Tutorial** Staff

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 490a, Religion and Society** Eric Greene

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 491a and RLST 492b, The Senior Essay** Travis Zadeh

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 110a, First-Year Russian I Staff

A video-based 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 RP 1½ Course cr

RUSS 120b, First-Year Russian II Staff

Continuation of RUSS 110. After RUSS 110 or equivalent. L2 RP 1½ Course cr

RUSS 125a, Intensive Elementary Russian Constantine Muravnik

An intensive course that covers in one term the material taught in RUSS 110 and 120. For students of superior linguistic ability. Study of Russian grammar; practice in conversation, reading, and composition. Recommended for prospective majors in Russian and in Russian and East European Studies. L1, L2 RP 2 Course cr

RUSS 130a, Second-Year Russian I Irina Dolgova

A course to improve functional competence in all four language skills (speaking, writing, reading, and listening comprehension). Audio activities, for use both in the classroom and independently, are designed to help students improve their listening comprehension skills and pronunciation. Lexical and grammatical materials are thematically based. After RUSS 120 or equivalent. L3 RP 1½ Course cr

RUSS 140b, Second-Year Russian II Irina Dolgova

Continuation of RUSS 130. After RUSS 130 or equivalent. L4 RP 1½ Course cr

RUSS 145b, Intensive Intermediate Russian Constantine Muravnik

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 RP
2 Course cr

RUSS 150a, Third-Year Russian I Constantine Muravnik

Intensive practice in conversation and composition accompanied by review and refinement of grammar. Readings from nineteenth- and twentieth-century literature, selected readings in Russian history and current events, and videotapes and films are used as the basis of structured conversation, composition, and grammatical exercises. Oral and written examinations. Audiovisual work in the Center for Language Study required. After RUSS 140 or 145 or equivalent. L5 RP 1½ Course cr

RUSS 151b, Third-Year Russian II Constantine Muravnik

Continuation of RUSS 150. After RUSS 150 or equivalent. L5 RP 1½ Course cr

RUSS 160a, Fourth-Year Russian I Irina Dolgova

Discussion topics include Russian culture, literature, and self-identity; the old and new capitals of Russia, the cultural impact of the Russian Orthodox Church, and Russia at war. Readings from mass media, textbooks, and classic and modern literature. Use of video materials. After RUSS 151 or equivalent. L5

RUSS 161b, Fourth-Year Russian II Irina Dolgova

Continuation of RUSS 160. After RUSS 160 or equivalent. L5

*** RUSS 172a, Russian History through Literature and Film** Irina Dolgova

Study of important events in Russian history, from the medieval times to the present, through authentic reading materials in various genres and through feature and documentary films. The course is designed to advance students' speaking proficiency in Russian and to develop their reading, listening, and writing skills. Texts include Russian fairy tales; fragments from *The Primary Chronicles*; A. Tolstoy's *Peter I*; D. Merezhkovsky's *Antichrist*; N. Eidelman's *Decembrists*; P. Chaadaev's *Philosophical Letters*; N. Leskov's *Enchanted Wanderer* (fragments); and I. Goncharov's *Oblomov* (fragments). Films include A. Tarkovsky's *Andrei Rublev*; N. Mikhalkov's *Several Days from Oblomov's Life*; A. Askoldov's *Comissar*; Todorovsky's *Stiliagi*; K. Muratova's *Asthenic Syndrome*; and A. Zviagintsev's *Loveless*. All written assignments, texts, and discussions are in Russian. RUSS 142 or 151, or permission of instructor. L5, HU

*** RUSS 174b, The Russian Works of Vladimir Nabokov** Constantine Muravnik

An aesthetic reading of Vladimir Nabokov's Russian works. Nabokov as a writer who first and foremost was interested in the question of the ontological significance of art and, consequently, in various modes of the artist's relationship to the world. Prerequisite: RUSS 150 or equivalent, or with permission of instructor. L5, HU RP

*** RUSS 177b, Fantastika: Russian Fantasy and Science Fiction** Staff

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 178a, The Short Story in Russian** Julia Titus

Chronological study of celebrated Russian short stories. Authors include Pushkin, Gogol, Tolstoy, Dostoevsky, Chekhov, Nabokov, and Tolstaya. Readings and discussion in Russian. Prerequisite: RUSS 140, 145, or equivalent. L5, HU

RUSS 220b / HSAR 221b, Russian and Soviet Art, 1757 to the Present Molly Brunson

The history of Russian and Soviet art from the foundation of the Academy of the Arts in 1757 to the present. Nineteenth-century academicism, romanticism, and realism; the Russian avant-garde and early Soviet experimentation; socialist realism and late- and post-Soviet culture. Readings and discussion in English. HU TR

* **RUSS 246a / RSEE 246a, Love and Death in the Russian Short Story** Edyta Bojanowska

A brilliant counterpart to the expansive Russian novel, the Russian short story is held in high esteem by the genre's connoisseurs and practitioners. This course explores both the classics and the hidden gems of the Russian short-story tradition from the 19th century to today, focusing on the most universal themes of story-writing: love and death. The course poses the following questions: What is distinctive about the short story form? How do stories "talk to" other stories in a tradition? What narrative twists and complications do authors use to keep readers hooked and spellbound? The readings cover most major Russian writers and movements, so the course provides a good overview of modern Russian literature. All readings and discussion in English. WR, HU

RUSS 254a / LITR 245a / RSEE 254a, Tolstoy and Dostoevsky Molly Brunson

Close reading of major novels by two of Russia's greatest authors. Focus on the interrelations of theme, form, and literary-cultural context. Readings and discussion in English. HU TR

* **RUSS 329a / HIST 398Ja / MMES 300a / RSEE 329a, Introduction to Modern Central Asia** Staff

An overview of the history of modern Central Asia—modern-day Kazakhstan, Kyrgyzstan, Turkmenistan, Tajikistan, Uzbekistan, and the Xinjiang Uyghur Autonomous Region of the People's Republic of China. This course shows Central Asia to be a pivotal participant in some of the major global issues of the 20th and 21st centuries, from environmental degradation and Cold War, to women's emancipation and postcolonial nation-building, to religion and the rise of mass society. It also includes an overview of the region's longer history, of the conquests by the Russian and Chinese empires, the rise of Islamic modernist reform movements, the Bolshevik victory, World War II, the *perestroika*, and the projects of post-Soviet nation-building. Readings in history are supplemented by such primary sources as novels and poetry, films and songs, government decrees, travelogues, courtly chronicles, and the periodical press. All readings and discussions in English. HU TR

* **RUSS 380a / FILM 360a / LITR 301a / RSEE 380a, Putin's Russia and Protest Culture** Marijeta Bozovic

Survey of Russian literature and culture since the fall of communism. The chaos of the 1990s; the solidification of power in Putin's Russia; the recent rise of protest culture.

Sources include literature, film, and performances by art collectives. Readings and discussion in English; texts available in Russian. WR, HU

* **RUSS 465a / FILM 429a / LITR 466a, War in Literature and Film** Katerina Clark
Representations of war in literature and film; reasons for changes over time in portrayals of war. Texts by Stendahl, Tolstoy, Juenger, Remarque, Malraux, and Vonnegut; films by Eisenstein, Tarkovsky, Joris Ivens, Coppola, Spielberg, and Altman.
HU

* **RUSS 480a and RUSS 481b, Directed Reading in Russian Literature** Staff
Individual study under the supervision of a faculty member selected by the student. Applicants must submit a prospectus approved by the adviser to the director of undergraduate studies by the end of the first week of classes in the term in which the course is taken. The student meets with the adviser at least one hour each week, and takes a final examination or writes a term paper. No credit granted without prior approval of the director of undergraduate studies.

* **RUSS 490a or b, The Senior Essay** Staff
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 222b / HIST 222Jb, 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

RSEE 225a / HIST 290a, Russia from the Ninth Century to 1801 Paul Bushkovitch
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

* **RSEE 246a / RUSS 246a, Love and Death in the Russian Short Story** Edyta Bojanowska
A brilliant counterpart to the expansive Russian novel, the Russian short story is held in high esteem by the genre's connoisseurs and practitioners. This course explores both the classics and the hidden gems of the Russian short-story tradition from the 19th century to today, focusing on the most universal themes of story-writing: love and death. The course poses the following questions: What is distinctive about the short story form? How do stories "talk to" other stories in a tradition? What narrative twists and complications do authors use to keep readers hooked and spellbound? The readings cover most major Russian writers and movements, so the course provides a good overview of modern Russian literature. All readings and discussion in English.
WR, HU

RSEE 254a / LITR 245a / RUSS 254a, Tolstoy and Dostoevsky Molly Brunson
Close reading of major novels by two of Russia's greatest authors. Focus on the interrelations of theme, form, and literary-cultural context. Readings and discussion in English. HU

RSEE 268b / ER&M 263b / HIST 264b, Eastern Europe since 1914 Timothy Snyder
Eastern Europe from the collapse of the old imperial order to the enlargement of the European Union. Main themes include world war, nationalism, fascism, and communism. Special attention to the structural weaknesses of interwar nation-states and postwar communist regimes. Nazi and Soviet occupation as an age of extremes. The collapse of communism. Communism after 1989 and the dissolution of Yugoslavia in the 1990s as parallel European trajectories. HU

RSEE 271a / HIST 271a / HUMS 339a, European Intellectual History since Nietzsche
Marci Shore
Major currents in European intellectual history from the late nineteenth century through the twentieth. Topics include Marxism-Leninism, psychoanalysis, expressionism, structuralism, phenomenology, existentialism, antipolitics, and deconstruction. HU

* **RSEE 300b / CZEC 301b / LITR 220b, Milan Kundera: The Czech Novelist and French Thinker** Karen von Kunes
Close reading of Kundera's novels, with analysis of his aesthetics and artistic development. Relationships to French, German, and Spanish literatures and to history, philosophy, music, and art. Topics include paradoxes of public and private life, the irrational in erotic behavior, the duality of body and soul, the interplay of imagination and reality, the function of literary metaphor, and the art of composition. Readings and discussion in English. HU TR

* **RSEE 329a / HIST 398Ja / MMES 300a / RUSS 329a, Introduction to Modern Central Asia** Staff
An overview of the history of modern Central Asia – modern-day Kazakhstan, Kyrgyzstan, Turkmenistan, Turkmenistan, Tajikistan, Uzbekistan, and the Xinjiang Uyghur Autonomous Region of the People's Republic of China. This course shows Central Asia to be a pivotal participant in some of the major global issues of the 20th and 21st centuries, from environmental degradation and Cold War, to women's emancipation and postcolonial nation-building, to religion and the rise of mass society. It also includes an overview of the region's longer history, of the conquests by the Russian and Chinese empires, the rise of Islamic modernist reform movements, the Bolshevik victory, World War II, the *perestroika*, and the projects of post-Soviet nation-building. Readings in history are supplemented by such primary sources as novels and poetry, films and songs, government decrees, travelogues, courtly chronicles, and the periodical press. All readings and discussions in English. HU

* **RSEE 380a / FILM 360a / LITR 301a / RUSS 380a, Putin's Russia and Protest Culture** Marijeta Bozovic
Survey of Russian literature and culture since the fall of communism. The chaos of the 1990s; the solidification of power in Putin's Russia; the recent rise of protest culture. Sources include literature, film, and performances by art collectives. Readings and discussion in English; texts available in Russian. WR, HU

* **RSEE 470a or b, Individual Writing Tutorial** Staff

* **RSEE 490a and RSEE 491b, The Senior Essay** Jinyi Chu

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 110a / LING 115a, 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 130a / LING 138a, 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 160a, Advanced Sanskrit: Readings in Poetry and Drama** Aleksandar Uskokov

The purpose of this course is to introduce the jargon of classical Sanskrit literature, specifically the interrelated genres of *mahā-kāvya* or court epic; *nāṅaka* or drama; and hagiography or *carita*. Special attention is given to matters of style and advanced morphology and syntax. Additionally, the course introduces scholastic techniques of text interpretation. Finally, the course looks at the phenomenon of retelling stories from Vedas, the epics, or the Buddhist *sūtras* in classical Sanskrit literature, combining thus advanced language instruction with learning cultural content. Prerequisites: previous terms of Sanskrit to L4 or equivalent. L5 RP

Science (SCIE)

* **SCIE 010a and SCIE 011b, Perspectives on Biological Research** Sandy Chang

The goal of this two course series is to introduce Science, Technology, and Research Scholars 1 (STARS1) passionate about conducting research in the life sciences to the outstanding research opportunities available to them. Thirteen Yale faculty, well known as excellent undergraduate research mentors, will lecture on their own research and serve as potential future research mentors. Students emerge from this course with an appreciation for the diverse research conducted by Yale biologists. They also learn skills essential for any successful scientist, including how to (1) read the primary scientific literature on the research conducted by each faculty, (2) present this material to the class and, (3) write a grant proposal. Credit for SCIE 010 only on completion of SCIE 011; one course credit, one Sc credit, and guaranteed summer research funding is awarded for successful completion of the year's work. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. Prerequisite: Score of 5 on AP biology test or equivalent on IB biology exam. WR, SC ½ Course cr per term

Sinhala (SNHL)

Slavic Languages and Literatures (SLAV)

* **SLAV 230a, The Slavic World Between Christendom East and West** John Mikitish

The Orthodox Church figures large in both Western and Russian accounts of Putin's Russia; church politics and inter-Christian conflicts play a major role in the politics of contemporary Ukraine. In many ways, these are just the latest chapters in an ongoing process of religious encounter, conflict, and exchange on the Slavic borderlands of Eastern and Western Christendom. Drawing on the disciplinary tools and conclusions of literary studies, history, and religious studies, this course proposes to explore this continuing story through texts, images, and other media. WR, HU

Sociology (SOCY)

* **SOCY 081b / ER&M 081b / MUSI 081b, 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. Pre-registration required: see under First Year Seminar Program. SO

SOCY 101b, Introduction to Sociology Philip Smith

The class opens a doorway to sociology as an academic discipline. This is the systematic and rigorous study of society at all levels from the interpersonal, through institutions, organizations, and groups, to the level of the nation and world system. We cover the major research methods, forms of explanation, core concepts, and theoretical models. Substantive topics include inequality, race, gender, networks, culture, deviance, social change, and social behaviors among others. SO

SOCY 102b / HIST 381b / MMES 102b / NELC 102b, Introduction to the Middle East
Jonathan Wyrzten

Introduction to the history, politics, societies, and cultures of the Middle East. Topics and themes include geopolitics, environment, state formation, roles of Judaism/Christianity/Islam, empire&colonialism, nationalism, regional & global wars, Palestine-Israel conflict, US and other Great Power intervention. HU, SO

SOCY 112a / EDST 110a, Foundations in Education Studies Mira Debs

Introduction to key issues and debates in the U.S. public education system. Focus on the nexus of education practice, policy, and research. Social, scientific, economic, and political forces that shape approaches to schooling and education reform. Theoretical and practical perspectives from practitioners, policymakers, and scholars. SO

SOCY 127a / ER&M 127a / EVST 127a / WGSS 127a, Health and Illness in Social**Context** Alka Menon

Present-day medicine and health care provide solutions to an ever-increasing array of human problems. Yet the achievement of health can be elusive. This course provides a broad introduction to the domains of health and illness in the U.S., with some coverage of international trends and topics. Students analyze how our personal health and public health are shaped by social structures, political struggles, expert knowledge, and medical markets. Topics include the cultural and social meanings associated with health and illness; inequalities in health and health care access and provision; controversies surrounding healthcare, medical knowledge production, and medical decision-making; and the social institutions of the health care industry. None SO

SOCY 133a, 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 RP

SOCY 134a / AMST 134a / ER&M 264a / WGSS 110a, Sex and Gender in Society

Rene Almeling

Introduction to the social processes through which people are categorized in terms of sex and gender, and how these social processes shape individual experiences of the world. Sex and gender in relation to race/ethnicity, class, sexuality, nationality, education, work, family, reproduction, and health. SO

SOCY 147b, Introduction to Social Policy Analysis Scott Boorman

The capabilities and limitations of four fundamental tools of policy: markets, networks, bureaucracy, and legislation. Examples from the policy history of the United States since the 1930s and from formal models of social structure and process. SO

SOCY 151a / PLSC 290a, Foundations of Modern Social Theory Emily Erikson

Major works of social thought from the beginning of the modern era through the 1900s. Attention to social and intellectual concepts, conceptual frameworks and methods, and contributions to contemporary social analysis. Writers include W.E.B. Du Bois, Simone De Beauvoir, Adam Smith, Thomas Hobbes, Jean-Jacques Rousseau, Immanuel Kant, Emile Durkheim, Max Weber, and Karl Marx. SO

*** SOCY 152b, 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. None. Though "Foundations of Modern Social Theory" or equivalent is strongly recommended. WR, SO

SOCY 153a / AFAM 118a / ER&M 249a / PSYC 336a, Is That Racist?: Theory and Methods for Diagnosing and Demonstrating Racism Phillip Atiba Goff

How do we know when something is racist? And how do we prove it to those who are skeptical? This course is designed to allow students to go beyond armchair pontificating about racism by exploring a broad range of ways social theorists have defined the term and methods they have used to demonstrate it. Together, we have the opportunity to read, critique, and synthesize scholarship from across disciplines, with the goal of refining our own definition of the term. To accomplish this, we examine the stakes of calling something racist, who benefits and who suffers from a given definition, and how racism functions across contexts (mostly) within the United States. We also learn about popular methods for demonstrating that an idea, feeling, behavior, person, or institution is racist and evaluate how evidence about racism (or lack thereof) can obscure a diagnosis of racism—or lead to an erroneous one. Throughout the course, we take opportunities to translate the theoretical and methodological lessons we learn to the world we live in today, from popular culture to dinner table conversations. While there are no statistical prerequisites, students will be asked to think about the logic of statistical analysis and should be comfortable reasoning about numbers. HU, SO

* **SOCY 160b, Methods of Inquiry** Alka Menon

The theory and practice of social inquiry. How social scientists—and aspiring social scientists—actually do their work, including designing research, sampling and measuring, and interpreting results. Examination of thesis proposal writing; ethical quandaries involved in social research. No background in social research assumed. SO

* **SOCY 162a / EDST 162a, Methods in Quantitative Sociology** Daniel Karell

Introduction to methods in quantitative sociological research. Topics include: data description; graphical approaches; elementary probability theory; bivariate and multivariate linear regression; regression diagnostics. Students use Stata for hands-on data analysis. QR, SO

* **SOCY 163b / S&DS 175b, YData: Measuring Culture** Daniel Karell

Culture is increasingly digital. Cultural objects, such as songs and artwork, are frequently digitized. Creating culture objects often involves digital tools and takes place in digital domains. The effects of culture on our social lives are now typically mediated by digital platforms and devices. In this introductory course, we explore how data science is being used to measure the cultural landscape, the consumption and production of culture, and the impact of culture on society. To do so, we review current theories and methodologies, as well as conduct our own analyses of popular culture, the rhetoric and social connections underlying online extremist communities, and other topics. The course provides opportunities to practice the data science skills presented in S&DS 123 with applications to the social scientific study of culture. This course can be taken concurrently with S&DS 123 or after successfully completing it. QR, SO

SOCY 170a / AFAM 186a / LAST 214a / PLSC 378a, Contesting Injustice Elisabeth Wood

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 freshmen and sophomores. SO

* **SOCY 172a / EP&E 241a / PLSC 415a, Religion and Politics in the World** Katharine Baldwin

A broad overview of the relationship between religion and politics around the world, especially Christianity and Islam. Religions are considered to constitute not just theologies but also sets of institutions, networks, interests, and sub-cultures. The course's principal aim is to understand how religion affects politics as an empirical matter, rather than to explore moral dimensions of this relationship. SO

SOCY 190a / AFAM 196a / AMST 196a / ER&M 226a / EVST 196a, Race, Class, and Gender in American Cities Laura Barraclough

Examination of how racial, gender, and class inequalities have been built, sustained, and challenged in American cities. Focus on the twentieth and twenty-first centuries. Topics include industrialization and deindustrialization, segregation, gendered public/private split, gentrification, transit equity, environmental justice, food access, and the relationships between public space, democracy, and community wellbeing. Includes field projects in New Haven. SO

* **SOCY 202b, Cultural Sociology** Jeffrey Alexander

Study of "irrational" meanings in supposedly rational, modern societies. Social meanings are symbolic, sensual, emotional, and moral. They affect every dimension of social life, from politics and markets to race and gender relations, class conflict, and war. Examination of century old counter-intuitive writings of Durkheim and Weber, breakthroughs of semiotics and anthropology in mid-century, creation of modern cultural sociology in the 1980s, and new thinking about social performance and material icons today. Topics include: ancient and modern religion, contemporary capitalism, professional wrestling, the Iraq War, impeachment of Bill Clinton, Barack Obama's first presidential campaign, and the new cult of vinyl records. SO

* **SOCY 209b, 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 221b / MGRK 236b / PLSC 138b, The Euro Crisis** Paris Aslanidis

Examination of how Europe continues to struggle with the social and economic repercussions of the Great Recession and the impact of socioeconomic asymmetries in countries such as Portugal, Ireland, Spain, Italy, and Greece. Topics include the euro as a viable common currency; why and how the Euro crisis erupted and spread; how the COVID-19 fallout will impact the Union. SO

SOCY 223b / ER&M 206b / PLSC 437b, The Politics of Ethnic and National Identity Maria Jose Hierro

Introduction to the study of ethnic and national identity, their determinants and consequences in comparative perspective. SO

* **SOCY 228b, Norms and Deviance** Elijah Anderson

A sociological analysis of the origins, development, and reactions surrounding deviance in contemporary society. Group labeling, stigma, power, and competing notions of propriety. SO

*** SOCY 320b / HIST 324Jb / MMES 322b, World War I and the Making of the Modern Middle East** Jonathan Wyrzten

WWI fundamentally transformed the Middle East, unmaking the Ottoman Empire and unleashing competition among colonial and local actors to reshape region's political order that lasted well into the 1930s. This seminar examines what can be called the "Long Great War" in the Middle East. The first part examines the road to World War I and the course of the war in the Middle Eastern theater's principle fronts (Caucasus, Mesopotamia, Sinai/Syria, North Africa, Dardanelles). We then look at the period immediately following the October 1918 Mudros Armistice (that technically ended Allied/Ottoman hostilities). During this violent "Wilsonian Moment" in the Middle East, local aspirations for self-determination were articulated, reformulated, and argued locally and internationally while colonial actors – British, French, Italian, and Spanish – mobilized competing state-building projects. The last section of the course looks at the climax points of conflict between these competing projects in the mid to late 1920s – including the Great Syrian Revolt, the Rif War, Kurdish Revolts, Saudi wars of consolidation, and the Italo-Sanusi war in Libya – and how present-day political units were finally negotiated. We conclude discussing how the Long Great War continues to echo and resonate in contemporary upheaval in the Middle East a century later. HU, SO

*** SOCY 342a, 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 351a, Race, Medicine, and Technology** Alka Menon

Medicine and technology are important sources of authority and institutionalization in modern societies. Drawing insights from across sociological subfields, the course offers an in-depth investigation of race, medicine, and technology in the 20th and 21st centuries. This course examines the role of medicine and related technologies in defining race and perpetuating racism. We trace how race became an important component of biomedical research in the U.S. We also follow particular medical technologies across borders of time and space, using them to understand race and nationhood in transnational perspective. Taking a broad view of technology, we analyze cutting-edge, state-of-the art technologies alongside older, more mundane technologies and infrastructures. Ultimately, we consider how medical technologies are not just treatments for individual patients but also windows into broader social and cultural structures and processes. Prerequisite: Introductory social science or ER&M course. WR, SO

*** SOCY 352b / HUMS 247b, Material Culture and Iconic Consciousness** Jeffrey Alexander

How and why contemporary societies continue to symbolize sacred and profane meanings, investing these meanings with materiality and shaping them aesthetically. Exploration of "iconic consciousness" in theoretical terms (philosophy, sociology, semiotics) and further exploration of compelling empirical studies about food and bodies, nature, fashion, celebrities, popular culture, art, architecture, branding, and politics. HU, SO

* **SOCY 389a / GLBL 215a / LAST 386a / MGRK 237a / PLSC 375a, Populism** Paris Aslanidis

Investigation of the populist phenomenon in party systems and the social movement arena. Conceptual, historical, and methodological analyses are supported by comparative assessments of various empirical instances in the US and around the world, from populist politicians such as Donald Trump and Bernie Sanders, to populist social movements such as the Tea Party and Occupy Wall Street. so

* **SOCY 390b / ER&M 360b / HLTH 370b / HSHM 432b / WGSS 390b, Politics of Reproduction** Rene Almeling

Reproduction as a process that is simultaneously biological and social, involving male and female bodies, family formation, and powerful social institutions such as medicine, law, and the marketplace. Sociological research on reproductive topics such as pregnancy, birth, abortion, contraception, infertility, reproductive technology, and aging. Core sociological concepts used to examine how the politics of reproduction are shaped by the intersecting inequalities of gender, race, class, and sexuality. WR, SO

* **SOCY 491a and SOCY 492b, Senior Essay and Colloquium for Nonintensive Majors** Emily Erikson

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 493a and SOCY 494b, Senior Essay and Colloquium for Intensive Majors** Emily Erikson

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.

South Asian Studies (SAST)

* **SAST 020a / HIST 039a, Bombay/Mumbai: Life in a Megacity** Rohit De
Mumbai as a case study for the transformations brought by urbanization and modernity in Asia. Focus on how Mumbai's residents and its planners navigated the challenges of living in a rapidly growing cosmopolitan city and reflected it in their art and ideas. Themes include capitalism, globalization, British empire, religious pluralism, radical politics, organized crime, and Bollywood. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

* **SAST 061a / AMST 095a / ER&M 095a / THST 095a, South Asian American Theater and Performance** Shilarna Stokes

South Asian Americans have appeared on U.S. stages since the late nineteenth century, yet only in the last quarter century have plays and performances by South Asian Americans begun to dismantle dominant cultural representations of South Asian and South Asian American communities and to imagine new ways of belonging. This seminar introduces you to contemporary works of performance (plays, stand-up sets, multimedia events, and more) written and created by U.S.-based artists of South Asian descent as well as artists of the South Asian diaspora whose works have had an impact on U.S. audiences. With awareness that the South Asian American diaspora comprises

multiple, contested, and contingent identities, we investigate how artists have worked to manifest complex representations of South Asian Americans onstage, challenge institutional and professional norms, and navigate the perils and pleasures of becoming visible. HU

*** SAST 242b / PLSC 461b, India and Pakistan: Democracy, Conflict, and Development**
Steven Wilkinson

The variation in democracy, conflict, and development between India and Pakistan since 1947, as well as variation within each country. Management of ethnic and religious conflicts, secularism, secessionist movements in Kashmir and elsewhere, the tension between economic growth and equity, and problems of governance. SO

*** SAST 306a / ANTH 322a / EVST 324a, Environmental Justice in South Asia**

Kalyanakrishnan Sivaramakrishnan

Study of South Asia's nation building and economic development in the aftermath of war and decolonization in the 20th century. How it generated unprecedented stress on natural environments; increased social disparity; and exposure of the poor and minorities to environmental risks and loss of homes, livelihoods, and cultural resources. Discussion of the rise of environmental justice movements and policies in the region as the world comes to grips with living in the Anthropocene. SO

*** SAST 361a / HSAR 361, Visual South Asia: a Seminar on South Asian Art and Visual Culture** Akshaya Tankha

What do disparate events such as the destruction of the Bamiyan Buddhas in Afghanistan or the construction of statues of B.R. Ambedkar, historical figure of Dalit resistance in India, tell us about the changing relationship between aesthetics and politics in South Asia? How do they resonate with movements around the world, such as Rhodes Must Fall in South Africa or BLM in North America? How do South Asian art and cultural practices attune us to its historical, cultural, and political formations? And, how do they illuminate issues of gender, caste, labor, Indigeneity, decolonization, and nationalism in modern South Asia and the rise of religious majoritarianism today? This course addresses these questions through a selective exploration of artistic production, understood to include material culture, sculpture, architecture, painting, mechanically reproduced images and new media technologies, as part of a large and shifting field of cultural practice. It also considers the many cultural conceptions of space and place that regional art constitutes, which challenge the idea of South Asia as a singular or stable category. HU, SO

*** SAST 470a and SAST 670a / PHIL 429a / RLST 430a, Indian Philosophy in Sanskrit Literature** Aleksandar Uskokov

In this course we focus on issues of philosophical significance in Sanskrit literature of "non-standard" philosophical genres, i.e., other than the treatise and the commentary. Specifically we read from canonical Hindu texts such as the Upani#ads, Mahābhārata, Rāmāya#a, Bhāgavata Purā#a, Bhagavad-gītā, and Yogavāsi##ha; the classical genres of drama and praise poetry; and hagiographical literature, all in English translation. Attention is paid not only to substance but also form. The selection of philosophical problems includes philosophy of mind and personal identity; allegory; the ethics of non-violence; philosophy, politics, and religious pluralism; the highest good; theodicy; philosophical debate; etc. HU

Spanish (SPAN)

* SPAN 110a or b, 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 RP 1½ Course cr

SPAN 120a or b, 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 RP 1½ Course cr

* SPAN 125a, Intensive Elementary Spanish Maria-Lourdes Sabe Colom

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 130a or b, 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 RP 1½ Course cr

* SPAN 132a, Spanish for Heritage Speakers I Sybil Alexandrov

A language course designed for students who have been exposed to Spanish—either at home or by living in a Spanish-speaking country—but who have little or no formal training in the language. Practice in all four communicative skills (comprehension, speaking, reading, writing), with special attention to basic grammar concepts, vocabulary building, and issues particular to heritage speakers. This course meets during *Reading Period*: the period between the last week of classes and finals week. Admission in accordance with placement results. L3

SPAN 140a or b, 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 RP 1½ Course cr

* SPAN 142b, Spanish for Heritage Speakers II Sybil Alexandrov

Continuation of SPAN 132. Examination of complex grammar structures; consideration of problems particular to heritage speakers through the reading of both literary and journalistic texts. Practice in all communicative skills (comprehension, speaking, reading, writing). After SPAN 132 or in accordance with placement results. L4 RP

SPAN 150a or b, Advanced Oral and Written Communication in Spanish Staff

Instruction in refining reading, writing, aural, and oral skills. Students reach proficiency at the advanced high level (according to ACTFL guidelines) in the four language skills of listening, speaking, reading, and writing. Conducted in Spanish. Open to heritage speakers placed at the L5 level. Prerequisite: SPAN 140 or 145, or in accordance with placement results. L5 RP

*** SPAN 222a / LAST 222a, 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 223a or b / LAST 223a or b, Spanish in Film: An Introduction to the New Latin American Cinema** Margherita Tortora

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 225b / LAST 225b, Spanish for the Medical Professions** Mercedes Carreras

Topics in health and welfare. Conversation, reading, and writing about medical issues for advanced Spanish-language students, including those considering careers in medical professions. Enrollment limited to 18. L5

*** SPAN 227a / LAST 227a, Creative Writing** Maria Jordan

An introduction to the craft and practice of creative writing (fiction, poetry, and essays). Focus on the development of writing skills and awareness of a variety of genres and techniques through reading of exemplary works and critical assessment of student work. Emphasis on the ability to write about abstract ideas, sentiments, dreams, and the imaginary world. 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 228a or b, 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. Like geographical borders, social borders such as race, caste, class, and gender can form and perpetuate privileged categories of humans that restrict access of excluded persons to natural 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 students will investigate the multiple ways in which social, cultural, and spatial borders are initiated, expressed, materialized, and contested. Some of the questions that will guide our conversations are: What are social borders and what are the processes through which they perdure? How do the effects of local practices that transcend borders (e.g., environmental pollution, deforestation)

change our understanding of borders? How does globalization change discourse about borders? (To be conducted in Spanish.) L5

* **SPAN 243a / LAST 243a, Advanced Spanish Grammar** Terry Seymour

A comprehensive, in-depth study of grammar intended to improve students' spoken and written command of Spanish. Linguistic analysis of literary selections; some English-to-Spanish translation. Enrollment limited to 18. L5

SPAN 244b / LAST 120b / LAST 244b, Writing in Spanish Margherita Tortora

Intensive instruction and practice in writing as a means of developing critical thinking. Recommended for students considering courses in literature. Analysis of fiction and nonfiction forms, techniques, and styles. Classes conducted in a workshop format. L5

SPAN 247a / LAST 247a, Introduction to the Cultures of Latin America Staff

A chronological study of Latin American cultures through their expressions in literature and the arts, beginning in the pre-Columbian period and focusing on the period from the nineteenth century to the present. Emphasis on crucial historical moments and on distinctive rituals such as fiestas. 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 261a / LAST 261a, Studies in Spanish Literature I Jesus Velasco

An introduction to Spanish prose, drama, and lyric poetry from their medieval multicultural origins through the Golden Age in the seventeenth century. Readings include *El Cid*, *La Celestina*, *Conde Lucanor*, and works by Miguel de Cervantes and Calderón de la Barca. 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 262b / LAST 262b, Studies in Spanish Literature II** Jesus Velasco

An introduction to Spanish prose, drama, and lyric poetry from the eighteenth century to the present, centered on the conflict between modernity and tradition and on the quest for national identity. Texts by Gustavo Adolfo Bécquer, Emilia Pardo Bazán, Antonio Machado, Federico García Lorca, Ramón Sender, and Ana María Matute, among others. Open to students who have placed into L5 courses or who have successfully completed an L4 course in Spanish. L5, HU

* **SPAN 323a / WGSS 403a, 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 358a / LAST 358a, Contemporary Spanish Caribbean Literature** Anibal González-Pérez

Introduction to contemporary literature from Cuba, Dominican Republic, and Puerto Rico, through prose and poetry works by representative authors: Nicolás Guillén, Alejo Carpentier, José Lezama Lima, Antonio José Ponte, Ena Lucía Portela, Juan Bosch, José Alcántara Almánzar, Rita Indiana, Luis Palés Matos, Luis Rafael Sánchez, Mayra Santos-Febres, Luis Negrón. Topics include colonialism and postcoloniality; race, gender, and nation; Cuba's Special Period; and the Puerto Rican debt crisis. Prerequisites: SPAN 140, 142, 145, or equivalent. L5, HU

* **SPAN 371a / LAST 371a, Science and Fiction in Spanish American Narrative** Anibal González-Pérez

A study of the speculative incorporation of scientific ideas and themes in contemporary Spanish American fiction from Argentina, Chile, Cuba, Dominican Republic, Ecuador, and Peru. Readings and discussions of early and mid-20th-century precursors, such as Jorge Luis Borges, Adolfo Bioy Casares, Leopoldo Lugones, Pablo Palacio, and Clemente Palma; of late-20th to early 21st-century examples of “technowriting” in Samantha Schwebelin, Jorge Volpi, and Alejandro Zambra, and of utopias, dystopias and possible futures in Jorge Adolph, Jorge Baradit, Hugo Correa, Angélica Gorodischer, Francisco Ortega, Yoss, Yuri Herrera, and Carlos Yushimito. Related themes include: post-humanism, ecofiction, and sociopolitical satire. Course is taught in Spanish. Prerequisite: L4 Spanish or higher. L5, HU

SPAN 404a / ANTH 264a / ARCG 264a, Aztec Archaeology and Ethnohistory Oswaldo Chinchilla Mazariegos

An anthropological and ethnohistorical examination of the Aztec civilization that dominated much of Mexico from the fourteenth century until the Spanish Conquest of 1521. SO

* **SPAN 478a and SPAN 479b, Directed Readings and/or Individual Research** Noel Valis

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.

* **SPAN 491a or b, The Senior Essay** Noel Valis

A research project completed under faculty supervision and resulting in a paper of considerable length, in Spanish.

Special Divisional Major (SPEC)

Statistics and Data Science (S&DS)

S&DS S230Ea or b / S&DS 230a or b, Data Exploration and Analysis Staff

Online Course. 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. Enrollment limited to 20 students. 1 Credit. Technology Fee: \$85. Tuition: \$4,500. Session B: July 12 - August 13. Prerequisite: a 100-level Statistics course or equivalent (high school AP statistics), or with permission of instructor. Students should already have a knowledge of basic statistics and graphics, and be familiar with confidence intervals, hypothesis tests, and the normal and t distributions. QR

S&DS 100b, 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 and regression. Application of statistical

concepts to data; analysis of real-world problems. May not be taken after S&DS 101–106 or 109. QR

S&DS 101a / E&EB 210a, Introduction to Statistics: Life Sciences Walter Jetz and

Jonathan Reuning-Scherer

Statistical and probabilistic analysis of biological problems, presented with a unified foundation in basic statistical theory. Problems are drawn from genetics, ecology, epidemiology, and bioinformatics. QR

S&DS 102a / EP&E 203a / PLSC 452a, Introduction to Statistics: Political Science

Jonathan Reuning-Scherer

Statistical analysis of politics, elections, and political psychology. Problems presented with reference to a wide array of examples: public opinion, campaign finance, racially motivated crime, and public policy. QR

S&DS 103a / EP&E 209a / PLSC 453a / S&DS 112Ea, Introduction to Statistics: Social Sciences Jonathan Reuning-Scherer

Descriptive and inferential statistics applied to analysis of data from the social sciences. Introduction of concepts and skills for understanding and conducting quantitative research. QR

S&DS 105a, Introduction to Statistics: Medicine Jonathan Reuning-Scherer

Statistical methods used in medicine and medical research. Practice in reading medical literature competently and critically, as well as practical experience performing statistical analysis of medical data. QR

S&DS 106a, Introduction to Statistics: Data Analysis Jonathan Reuning-Scherer

An introduction to probability and statistics with emphasis on data analysis. QR

S&DS 108a, 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, ANOVA, and logistic regression. This course is intended as a bridge between AP statistics and courses such as S&DS 230, 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 100, S&DS 101–106, PSYC 100, or any other full semester Yale introductory statistics courses. Students should consider S&DS 103 or both S&DS 108, 109. ½ Course cr

S&DS 109a, Introduction to Statistics: Fundamentals Jonathan Reuning-Scherer

General concepts and methods in statistics. Meets for the first half of the term only. May not be taken after S&DS 100 or 101–106. ½ Course cr

S&DS 112Ea / EP&E 209a / PLSC 453a / S&DS 103a, Introduction to Statistics:

Online Jonathan Reuning-Scherer

An online introduction to statistics and data analysis. Students will watch online videos / video capture from S&DS 103 (taught during the regular academic year), and then participate in twice weekly online discussions/lab sessions. Topics include basic descriptive statistics, graphics, basic probability, hypothesis testing and confidence intervals, regression, multiple regression, and one and two-way ANOVA. Emphasis is on practical applications - students will perform extensive statistical analysis using

MINITAB. There are 8 homework assignments, two exams, and a final project. High school level algebra. Calculus is not required. QR

*** S&DS 175b / SOCY 163b, YData: Measuring Culture** Daniel Karell

Culture is increasingly digital. Cultural objects, such as songs and artwork, are frequently digitized. Creating culture objects often involves digital tools and takes place in digital domains. The effects of culture on our social lives are now typically mediated by digital platforms and devices. In this introductory course, we explore how data science is being used to measure the cultural landscape, the consumption and production of culture, and the impact of culture on society. To do so, we review current theories and methodologies, as well as conduct our own analyses of popular culture, the rhetoric and social connections underlying online extremist communities, and other topics. The course provides opportunities to practice the data science skills presented in S&DS 123 with applications to the social scientific study of culture. This course can be taken concurrently with S&DS 123 or after successfully completing it. QR, SO

S&DS 220b, Introductory Statistics, Intensive Staff

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 230a or b / S&DS S230Ea or b, Data Exploration and Analysis Staff

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 238a, Probability and Statistics Joseph Chang

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 240a, An Introduction to Probability Theory Elisa Celis

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 241a / MATH 241a, Probability Theory Yihong Wu

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 242b / MATH 242b, Theory of Statistics William Brinda and Andrew Barron

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 262a / AMTH 262a / CPSC 262a, Computational Tools for Data Science Roy Lederman

Introduction to the core ideas and principles that arise in modern data analysis, bridging statistics and computer science and providing students the tools to grow and adapt as methods and techniques change. Topics include principal component analysis, independent component analysis, dictionary learning, neural networks and optimization, as well as scalable computing for large datasets. Assignments include implementation, data analysis and theory. Students require background in linear algebra, multivariable calculus, probability and programming. Prerequisites: after or concurrently with MATH 222, 225, or 231; after or concurrently with MATH 120, 230, or ENAS 151; after or concurrently with CPSC 100, 112, or ENAS 130; after S&DS 100-108 or S&DS 230 or S&DS 241 or S&DS 242. Enrollment is limited; requires permission of the instructor. QR

S&DS 265a, 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 312a, Linear Models William Brinda

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 317b, Applied Machine Learning and Causal Inference** Jas Sekhon

We cover approaches to causal inference using machine learning. Machine learning methods include bagging, boosting, random forests, and neural networks. Causal topics include randomized experiments with and without noncompliance, observational studies with and without ignorable treatment assignment, instrumental variables, and regression discontinuity. Assignments provide students with hands-on experience with the methods. Applications are drawn from a variety of fields including political science, economics, public health, and medicine. Programming is central to the course and is

based on the R programming language. Prerequisites: The equivalent of at least two of the following courses: S&DS 230, 238, 241 and 242; previous programming experience (e.g., R, Matlab, Python, C++), R preferred. Strong knowledge of OLS is assumed.
SO

S&DS 351b / EENG 434b / MATH 251b, Stochastic Processes Staff

Introduction to the study of random processes including linear prediction and Kalman filtering, Poisson 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 352b / MB&B 452b / MCDB 452b, 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

S&DS 363b, 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 364b / AMTH 364b / EENG 454b, Information Theory Andrew Barron

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 365b, Intermediate Machine Learning John Lafferty

Techniques for data mining and machine learning from both statistical and computational perspectives, including support vector machines, bagging, boosting, neural networks, and other nonlinear and nonparametric regression methods. Discussion includes the basic ideas and intuition behind these methods, a more formal understanding of how and why they work, and opportunities to experiment with machine learning algorithms and to apply them to data. After S&DS 242. QR

S&DS 400a / MATH 330a, Advanced Probability Sekhar Tatikonda

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 410a, Statistical Inference Zhou Fan

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 425b, Statistical Case Studies** Jay Emerson

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: prior course work in probability and statistics, and a data analysis course at the level of STAT 361, 363, or 365 (or STAT 220, 230 if supported by other course work). QR

S&DS 431a / AMTH 431a, Optimization and Computation Anna Gilbert

This course is designed for students in Statistics & Data Science who need to know about optimization and the essentials of numerical algorithm design and analysis. It is an introduction to more advanced courses in optimization. The overarching goal of the course is to teach students how to design algorithms for Machine Learning and Data Analysis (in their own research). This course is not open to students who have taken S&DS 430. Prerequisites: Knowledge of linear algebra, multivariate calculus, and probability. Linear Algebra, by MATH 222, 223 or 230 or 231; Graph Theory, by MATH 244 or CPSC 365 or 366; and comfort with proof-based exposition and problem sets, such as is gained from MATH 230 and 231, or CPSC 366.

S&DS 432b, Advanced Optimization Techniques Sekhar Tatikonda

This course covers fundamental theory and algorithms in optimization, emphasizing convex optimization. Topics covered include convex analysis; duality and KKT conditions; subgradient methods; interior point methods; semidefinite programming; distributed methods; stochastic gradient methods; robust optimization; and an introduction to nonconvex optimization. Applications accepted from statistics & data science, economics, engineering, and the sciences. Prerequisites: Knowledge of linear algebra, such as MATH 222, 225; multivariate calculus, such as MATH 120; probability, such as S&DS 241/541; optimization, such as S&DS 431/631; and, comfort with proof-based exposition and problem sets.

*** S&DS 480a 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 491a and S&DS 492b, Senior Project Sekhar Tatikonda

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.

Study of the City (STCY)

Tamil (TAML)

Theater and Performance Studies (THST)

* **THST 051a / CLCV 051a / HUMS 061a / LITR 029a, Performing Antiquity** Pauline LeVen

This seminar introduces students to some of the most influential texts of Greco-Roman Antiquity and investigates the meaning of their “performance” in different ways: 1) how they were musically and dramatically performed in their original context in Antiquity (what were the rhythms, the harmonies, the dance-steps, the props used, etc.); 2) what the performance meant, in socio-cultural and political terms, for the people involved in performing or watching it, and how performance takes place beyond the stage; 3) how these texts are performed in modern times (what it means for us to translate and stage ancient plays with masks, a chorus, etc.; to reenact some ancient institutions; to reconstruct ancient instruments or compose “new ancient music”); 4) in what ways modern poems, plays, songs, ballets constitute forms of interpretation, appropriation, or contestation of ancient texts; 5) in what ways creative and embodied practice can be a form of scholarship. Besides reading ancient Greek and Latin texts in translation, students read and watch performances of modern works of reception: poems, drama, ballet, and instrumental music. A few sessions are devoted to practical activities (reenactment of a symposium, composition of ancient music, etc.). Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

* **THST 092a / AFST 092a, African Rhythm in Motion** Lacina Coulibaly

This first-year seminar traces the transnational migration of the polyrhythms inherent in African dance. Based in movement practice, the course considers the transformation of rhythm through time and space, moving from traditional African dances of the 20th century into the work of contemporary African artists and far-flung hybrid dance forms such as samba and tango. Part dance history, part introduction to the art of dance, the course is open to movers of all backgrounds and physical abilities. The professor works with students who require necessary adaptations of the physical material to meet special needs. Enrollment limited to first-year students. Preregistration required; see under First-year Seminar Program. HU

* **THST 093b, Creativity, Collaboration, and the Art of Making Theater** Hal Brooks

Within theater, there is always an initial spark of creation, whether it initiates from the playwright, a group of improvisers, or a combination of playwright and a troupe of actors. This course focuses on how to investigate, analyze, replicate and catalyze that impulse. It sources many art forms as a window into how we create, and attempts to address how artists begin to move from idea to execution. What is creativity? Is it innate? Is it a skill that can be developed? How? What happens when two or more people are involved in that pursuit of creation? Which techniques are common across disciplines? And how might a theater artist learn about creative pursuits from artists in other disciplines including music, design, and fiction as well as theater? Students from all backgrounds and interests will delve into techniques, identifying and integrating habits that foster creativity, creating their own works over the semester, both in small and larger groups, in solo and group projects. Enrollment limited to first year students. Preregistration required; see under First-Year Seminar Program.

* **THST 095a / AMST 095a / ER&M 095a / SAST 061a, South Asian American Theater and Performance** Shilarna Stokes

South Asian Americans have appeared on U.S. stages since the late nineteenth century, yet only in the last quarter century have plays and performances by South Asian Americans begun to dismantle dominant cultural representations of South Asian and South Asian American communities and to imagine new ways of belonging. This seminar introduces you to contemporary works of performance (plays, stand-up sets, multimedia events, and more) written and created by U.S.-based artists of South Asian descent as well as artists of the South Asian diaspora whose works have had an impact on U.S. audiences. With awareness that the South Asian American diaspora comprises multiple, contested, and contingent identities, we investigate how artists have worked to manifest complex representations of South Asian Americans onstage, challenge institutional and professional norms, and navigate the perils and pleasures of becoming visible. HU

* **THST 098a, Composing and Performing the One Person Play** Hal Brooks

First-year actors, playwrights, directors, and even students who have never considered taking a theater class, create their own work through a combination of reading, analysis, writing, and on-your-feet exercises. Students read texts and view performances that are generated by one actor in an attempt to discover the methodology that works best for their own creations. The course culminates with a midterm and final presentation created and performed by the student. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

THST 110a, Collaboration Elise Morrison and Shilarna Stokes

This foundational course introduces collaborative techniques at the core of topics, domains, and practices integral to the major in Theater and Performance Studies. We explore the seeds of performance from its basic essence as human expression, to movement, text, and storytelling, gradually evolving into collectively created works of performance. Techniques and readings may be drawn from improvisation, dance, music, design and spoken word contexts, and will encourage cohort building, critical reflection, and the join of individual and collective artistic expression. Guests from within and outside performance disciplines enhance the potential to investigate crossover between different media. HU RP

THST 111b, Modes of Performance Staff

This foundational course introduces students to the breadth of topics, domains, and practices included in the major in Theater and Performance Studies, as well to faculty in the program. Building on practices of collaborative research and performance making established in MUSI 110, this course alternates between immersive, practical encounters with performance techniques from different disciplines and foundational methodologies for performance analysis. Structured around the four "domains" of study within the major—histories, performance theory, interarts, and artistic practice—this course hones students' practical, analytical, research, and multi-modal communication skills. HU

* **THST 129a or b / ENGL 129a or b / HUMS 127a or b / LITR 168a or b, Tragedy in the European Literary Tradition** Staff

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.

WR, HU

*** THST 210a, Performance Concepts** Staff

A studio introduction to the essential elements of acting. Coursework includes improvisation, performance exercises, scene study, and analysis grounded in the work of practitioners and theorists from Stanislavski to the present. This course is a prerequisite for several upper-level courses in Theater and Performance Studies including THST 211 and THST 300. It is open to students in all years of study, with the permission of the instructor. RP

*** THST 211b, Intermediate Acting** Joan MacIntosh

Continued study of acting as an art, building on performance concepts introduced in THST 210. Various approaches to the actor's task, requiring deeper understanding of conceptual issues and increasing freedom and individuality in building a character.

Exercises, monologues, and scene work. Admission by audition. Prerequisite: THST 210. HU RP

*** THST 212a, Community Engaged Theater and Performance** Shilarna Stokes

This seminar serves as an introduction to community engaged theater and performance. Alongside readings that provide grounding in the historical, theoretical, ethical, and artistic foundations of community engaged theater and performance in the United States, students learn about major companies currently producing work in this field: Theatre of the Oppressed-NYC, Urban Bush Women, Cornerstone Theater Company, Roadside Theater, Sojourn Theatre, Albany Park Theatre Project, and others. The course includes regular opportunities to acquire "on-your-feet" practice with techniques used by these companies as well as opportunities to converse with artists in the field and field trips to see work by New Haven-based companies. HU

*** THST 213b, The Process of New Play Development in American Theater** Hal Brooks

How does a play move from concept to page to production? What are the steps involved along the way? What are the techniques within each phase that playwrights, directors, and actors utilize towards developing a play? This seminar seeks to show the practical aspects of new play development beyond the role of actor. Students are introduced to voices and stories that have recently emerged, treating the script more as a fluid blueprint rather than an unchangeable text. Students analyze and compare various versions of a playscript through reading, staging, and discussion. Each student explores texts through the eyes of directors, playwrights, actors, designers, and dramaturgs—and at times adopts those roles within exercises. The course highlights the last fifteen years in American theater which has seen an unprecedented explosion of new plays, playwrights, and new play development incubators. Works by playwrights Will Eno, Annie Baker, Jackie Sibblies Drury, Sarah Delappe, and Sam Hunter are investigated, analyzed, and explored. Limited Enrollment. See Canvas for application.

THST 217b, Creating Theater for Young Audiences Deborah Margolin and Nathan Roberts

A studio-based exploration of creating Theater for Young Audiences (TYA). Beyond considerations of content, how does making theater for children differ from making theater for any audience? Through conversation with contemporary TYA practitioners, and a series of generative exercises in adaptation, students seek their own answers to this question. The semester culminates in a public workshop presentation (before a young audience) of original work created in class. Open to students of all majors. HU RP

* **THST 224a / MUSI 228a, Musical Theater Performance I** Maria-Christina Oliveras
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. Auditions/interviews will be scheduled during the first two weeks of August. May be repeated for credit. For audition information contact dan.egan@yale.edu. HU RP

* **THST 226b / MUSI 229b, Musical Theater Performance II** Staff
The collaborative process and its effect on musical theater performance. Choreography, music direction, and origination of new works. Analysis of texts, scripts, and taped or filmed performances; applications in students' own performance. May be repeated for credit. For audition information e-mail dan.egan@yale.edu. RP

* **THST 228b / ENGL 423b / FILM 397b, Writing about the Performing Arts**
Margaret Spillane
Introduction to journalistic reporting on performances as current events, with attention to writing in newspapers, magazines, and the blogosphere. The idea of the audience explored in relation to both a live act or screening and a piece of writing about such an event. Students attend screenings and live professional performances of plays, music concerts, and dance events. Formerly ENGL 244. WR, HU

* **THST 230a, Advanced Acting and Scene Study: Restoration Comedy** Toni Dorfman
An advanced acting seminar culminating in the presentation of scenes from late Restoration comedy. Units include babbling, costume, etymology, immediacy, movement, partner, props, and repartee. Solo exercises, monologues, long speeches, and scene work. Admission by audition in the Whitney Theater, 53 Wall Street, on the first day of class. Open to junior and senior Theater Studies majors only. May be taken more than once. Prerequisite: THST 211.

* **THST 236a / MUSI 185a, 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

*** THST 239a / AFAM 342a / ENGL 239a, African American Drama through 1959**

Shane Vogel

This course surveys the formal development and major themes of African American drama from the antebellum period through 1959. We examine how dramatists and performers reimagined the various meanings of Blackness in the U.S. public sphere, as well as individual and collective acts of self-fashioning on and off the stage. Special attention is given to aesthetic experimentation and its relationship to political theater; transformations of genre and form; Black dramatic theory; historical drama; diasporic connections and disconnections; the relationship between music, dance, spectacle, and drama; anti-lynching drama and folk drama; representations of class, gender, and sexuality; inter- and intra-racial conflict; Black radical theatre in the New Deal; and institutional histories of key Black theatre companies. HU

*** THST 248a / GMAN 248a or b / HUMS 236a or b / LITR 240a or b, Goethe's Faust**

Kirk Wetters and Jan Hagens

Goethe's *Faust*, with special attention to *Faust II* and to the genesis of *Faust* in its various versions throughout Goethe's lifetime. Emphasis on the work in context of Goethe's time and in the later reception and criticism. Reading knowledge of German beneficial but not required. HU

*** THST 249a / AFAM 246a / FILM 246a, Introduction to African American Cinema**

Nicholas Forster

This course examines the history of African American cinema from the turn of the twentieth century through the present. In recent years, there has been a growing sense that, after decades of unequal hiring practices, black filmmakers have carved a space for artistic creation within Hollywood. This feeling was emboldened when Ryan Coogler's *Black Panther* became the highest grossing film of the 2018, seemingly heralding a new age of black-authored and black-focused cinema. This course examines the long history of black cinema that led to the financial and critical success of filmmakers like Coogler, Ava DuVernay, and Jordan Peele. In this course, we survey the expansive work of black American cinema and ask: is there such a category as black film/cinema? If so, is that category based on the director, the actor, the subject matter or ideology of the film? What political, aesthetic, social, and personal value does the category of black film/cinema offer? Some of the filmmakers include Barry Jenkins, Kathleen Collins, Spike Lee, Julie Dash, Oscar Micheaux, Ava Duvernay, and Charles Burnett. HU

THST 262b / ENGL 159b / HUMS 213b / LITR 339b, Global Shakespeares: Race, Gender, and the Idea of the Human Ayesha Ramachandran

Shakespeare today is a global phenomenon: over five hundred years after his death, the playwright's legacy continues to flourish with new performances, reworkings, appropriations, and adaptations continuously produced across the world in a range of languages and across various media. Once exported along with the ideologies and practices of empire, Shakespeare's works have now become an index for the complex histories of colonialism and postcolonialism as well as a crucial site for studying processes of racialization and the universalizing idea of "the human." How did Shakespeare become global? Was the cultural imagination of his plays always already global, written at a time with the very notion of the modern world as we know was being shaped? This course explores the political afterlives of "Shakespeare" as a cultural icon and aesthetic touchstone for the Western tradition through a close reading of four plays alongside their adaptations: *Hamlet*, *Othello*, *King Lear*, and *Antony and Cleopatra*.

We look at films, novels, *manga* comics, memoirs, stand-up comic routines, along with classic stagings of the plays to elucidate the themes that have made Shakespeare global – in particular, questions of race, gender, sexuality, generational conflict, and political intrigue. Authors and directors include Akira Kurosawa, Vishal Bharadwaj, Janet Suzman, Iqbal Khan, James Baldwin, Sulayman Al-Bassam, Tayeb Salih, Preti Taneja, and Derek Walcott. This is the non-intensive writing version of LITR 340 and is worth 1 credit. It meets with LITR 340. Students may earn credit for LITR 339 (1 credit) or for LITR 340 (1.5 credits) but not for both. HU

* **THST 279a / ENGL 177a, Medieval Drama** Jessica Brantley

An exploration of medieval dramatic traditions in the context of other medieval and modern performative practices, including pageantry, song, spectacle, recitation, liturgy, and meditative reading. Texts include the York plays, *Everyman*, *Mankind*, the Digby *Mary Magdalene*, Sarah Ruhl's *Passion Play*, and Branden Jacobs-Jenkins' *Everybody*.
WR, HU

* **THST 300a, The Director and the Text I** Toni Dorfman

Basic exercises in approaching dramatic texts from the director's perspective. Particular attention to the many roles and functions of the director in production. Preparation and presentation of workshop scenes. Open to junior and senior Theater Studies majors, and to nonmajors with permission of the instructor. Limited Enrollment. See syllabus page on Canvas for application. Prerequisite: THST 210. HU

* **THST 301a, The Director and the Text II: Making the Post-Dramatic Theatre**
David Chambers

This studio course focuses on the making of theatre in the postdramatic era, meaning examining and practicing the tactics of production for the contemporary theatre where the written dramatic text is no longer a set of instructions for the director and collaborators, but a pretext for any number of performance games, adaptations, and artistic agendas far exceeding the conventional onstage illustration of the written text; meaning a radical and visceral theatre in which the performers have subsumed the dominance of the dramatic author to their own intentions and means, or become the authors themselves, or the dramatic author has ingested the spirit of postdramatic theatricalism into their own work. The course involves research from both written material and production videos, investigating the “scream” of each production#i.e. the artistic intention behind the making of the piece#and the rehearsal processes through which it was, or can be, made. Students regularly generate their own onstage work both outside and in class, inspired by, or “in the manner of”, the artists under examination. Prerequisite: THST 300 or permission of instructor. HU RP

* **THST 302a / FREN 322a, Revising Molière** Christophe Schuwey

A star author and a leading actor, Molière is a monument to French and Western cultures. But who#or what#is Molière? What lies behind the myth? This course examines the works and the world of the French Shakespeare, star of Versailles, and author of blockbusters still acclaimed today, 400 years later. Throughout his major comedies (on religion, women's rights, hypocrisy, ethics, travels, and many more topics) we explore the history of the French theater, study the rise of show business and advertisement, and the competition between authors, and between actors. The course also discusses modern staging of Molière's plays and include performances experiments. L5, HU

* **THST 315a / ENGL 211a, Acting Shakespeare** James Bundy

A practicum in acting verse drama, focusing on tools to mine the printed text for given circumstances, character, objective, and action; noting the opportunities and limitations that the printed play script presents; and promoting both the expressive freedom and responsibility of the actor as an interpretive and collaborative artist in rehearsal. The course will include work on sonnets, monologues, and scenes. Admission by audition. Preference to seniors and juniors; open to nonmajors. See Canvas for application. HU RP

* **THST 318b / MUSI 340b, Analyzing, Directing, and Performing Early Opera** Grant Herreid

Study of a seventeenth-century Venetian opera, with attention to structural analysis of text and music. Exploration of period performance practice, including rhetorical expression, musical style, gesture, dance, Italian elocution, and visual design. Production of the opera in conjunction with the Yale Baroque Opera Project. Open to all students, but designed especially for singers, instrumentalists, and directors. Admission by audition only. May be repeated for credit. For audition information e-mail grant.herreid@yale.edu. HU RP

* **THST 319b / AFAM 313b, Embodying Story** Staff

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. HU

* **THST 320a / ENGL 453a, 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

* **THST 321a / ENGL 477a, Production Seminar: Playwriting** Deborah Margolin

A seminar and workshop in playwriting with an emphasis on exploring language and image as a vehicle for “theatricality.” Together we will use assigned readings, our own creative work, and group discussions to interrogate concepts such as “liveness,” what is “dramatic” versus “undramatic,” representation, and the uses and abuses of discomfort.

* **THST 332a / AFAM 331a / FILM 329a, Black Film and Theatre** Nicholas Forster

This course examines the numerous connections, networks, and associations between black film and black theatre across the latter half of the twentieth century. While there has been a resurgence of interest in black theatre on and off Broadway in recent years, we look at critical works created by black writers who created spaces, slid into the cracks, and opened wide the chasms of possibility between cinema and drama. We ask: how have black artists used these two mediums to articulate a political consciousness? How have black writers built, ruptured, and amended the demands required by cultural institutions like Broadway and Hollywood? We investigate the tensions between ideas of the universal and the specific, all the while attending to the complex and complicated possibilities across two different mediums: cinema and the stage. The question of authorship in the move from stage to screen will be omnipresent as we ask what kinds

of performances are possible and what new worlds can be created in those transitions?
WR, HU

* **THST 335a / AFST 435a, 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 RP

* **THST 343b, Public Speaking** Elise Morrison

Development of skills in public speaking and in critical analysis of public discourse. Key aspects of rhetoric and cultural communication; techniques for formulating and organizing persuasive arguments, engaging with an audience, and using the voice and body effectively.

* **THST 367b / EALL 321b / EAST 401b, Theater and Drama Traditions of China and Japan** Staff

This seminar offers a window into Chinese and Japanese drama and theater traditions from their beginnings to the 20th century. We engage issues of dramatic texts as well as performance practices; thus, the course draws on material from theater history, performance and acting conventions, and the literary history of drama. Readings and discussions span major genres of dramatic writing and their different modes of performance, including the Chinese dramatic genres of zaju and chuanqi; Chinese performance styles of Beijing opera and Kunqu; and Japanese dramatic genres and performance practices of noh, kyogen, kabuki, and puppet theater. Throughout the course, we engage closely with dramatic texts as literature, giving detailed thematic readings to some canonical and non-canonical plays. We also consider how dramatic writing and theatrical performance relate to broader trends in sociopolitical history and literary history, exploring how dramatic texts and theatrical performance embody a multivalent and multisensory space that is unique among creative enterprises. We deal with both the actor and the text, and consider how each are conditioned by modern and premodern contexts. No prerequisites are required, although some prior knowledge of China or Japan is helpful. HU

* **THST 370b / PLSH 248b, Polish Theater and Its Traditions** Krystyna Illakowicz
Exploration of the rebellious, defiant, and explosive nature of Polish theater, including ways in which theater has challenged, ridiculed, dissected, and disabled oppressive political power. Polish experimental and absurdist traditions that resulted from a merger of the artistic and the political; environmental and community traditions of the Reduta Theatre; Polish-American theater connections. Includes attendance at live theater events as well as meetings with Polish theater groups and actors. HU TR

* **THST 380a or b / AMST 370a or b, Choreographic Invention in 20th Century America** Brian Seibert

An examination of major movements in the history of concert and social dance from the late nineteenth century to the present, including ballet, tap, jazz, modern, musical theater, and different cultural forms. Topics include tradition versus innovation, the influence of the African diaspora, and interculturalism. Exercises are used to illuminate analysis of the body in motion. Limited enrollment. See Canvas for details. WR, HU

* **THST 390a / ENGL 222a, 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

* **THST 395a / ART 389a, Postmodern Dance** Emily Coates

A studio-based exploration of the epochal shift in choreographic aesthetics known as postmodern dance. In the early 1960s, a cohort of young artists redefined what dance could be and do. Influenced by the composer John Cage, these artists invented new movement vocabularies and compositional forms. Through re-staging seminal dances from the 1960s and 1970s, we consider the social and political contexts in which postmodern dance emerged; its links to minimalism, sculpture, and experimental music; and its ongoing influence on twenty-first century global contemporary dance. The course includes a field trip to New York City to attend the reconstruction of Yvonne Rainer's dance "Parts of Some Sextets" (1965), which premieres in November in the Performa 19 Biennial. This class is open to students of all physical abilities and backgrounds; special accommodations will be crafted in the event of specific disabilities. HU

* **THST 400b / ART 385b / FILM 348b, Performance and the Moving Image** Emily Coates and Joan MacIntosh

The boundaries between live and mediated performance explored through the creation of an original work that draws on methods in experimental theater, dance, and video art. Questions concerning live versus mediated bodies, the multiplication of time, space, and perspective through technology, and the development of moving images. The final production includes both a live performance and an art video. Application deadline January 5, 2018. Contact the instructors for more information. Open to students of all levels and majors. WR, HU

* **THST 401a, Conceptual Sound Design for Theater** Nathan Roberts

Theoretical and practical considerations for conceptual sound design, the creation of aural content and imagery in support of dramatic action. The use of sound to communicate meaning and intention effectively in a theatrical setting. Auditory culture and the phenomenology of hearing; the role of technology in sound design; development of critical listening skills and of a foundational vocabulary for the medium. Projects focus on the generation of content and ideas in support of a text. HU

* **THST 411a, Special Topics in Performance Studies** Elise Morrison

This course accompanies the themed speaker series for the Performance Studies Working Group, a weekly meeting convened by faculty in Theater and Performance Studies and the Drama School's Dramaturgy and Dramatic Criticism program. For Fall 2020, the theme is "Presence." This concept invites inquiry into our suddenly increased reliance on virtual representation and engagement in performance, pedagogy, and politics during the COVID-19 pandemic. It also supports our ongoing efforts to engage in dialogues about systemic racism in not only our institutions, but also our embodied experiences. Students enrolled for credit complete weekly readings based on that week's scholarship. They write weekly written responses and a final paper, which they present at the final PSWG meetings. HU RP

* **THST 414a, Lyric Writing for Musical Theater** Staff

The craft of lyric writing in musical theater, opera, and crossover works. Both historical models and new composition used as objects of study. Analysis of song form and placement, and of lyric for character, tone, and diction. Creation of lyrics in context. Noted composers and lyricists of produced musical theater works join the class periodically to comment on the work created. Students also have the opportunity to conceive an original work of musical theater, a crossover work, or an opera libretto, and create portions of the score with original lyrics and music by student composers, with whom the writers will collaborate. Limited enrollment. Interested students should write to dan.egan@yale.edu for application requirements. May not be repeated for credit.

HU RP

* **THST 417a / MUSI 401a, Approaches to Dance and Music Relationships** Ming Wai Tai

The twentieth-century saw new and exciting ways for dance to relate to music. Some choreographers collaborated with composers in experimental ways, while others choreographed to existing non-dance music, and so on. These new artistic possibilities led to novel critical and philosophical questions concerning the relationship of music and dance. This course begins with a survey of dance-music relationships from the twentieth-century to the present, highlighting noteworthy collaborations between choreographers and composers. We then examine the perspectives of other dance writers, such as dancers, dance teachers, accompanists, critics, philosophers, and choreomusicologists, and discuss how they relate to, inform, or differ from one another and from choreographers and composers. We also discuss the broader social and intellectual environment in which these artworks and writings were produced (e.g. feminism, challenges to the work-concept in music, etc). HU

* **THST 427a / AMST 349a, Technologies of Movement Research** Emily Coates

An interdisciplinary survey of creative and critical methods for researching human movement. Humans move to communicate, to express emotions, to commune, to protest, to reflect and embody the natural world. Drawing on an array of artistic projects and scholarship (in dance and performance studies, art, anthropology, sociology, philosophy, cognitive science, and the history of science), we consider case studies that take up movement as both the object and method of inquiry. Class time and assignments include moving, reading, and watching. Movement exercises are adaptable to the remote environment. All physical capabilities are welcome; no prior experience in dance required. Limited enrollment. See Syllabus page on Canvas for application.

* **THST 452a, Acting: Constructing a Character** Gregory Wallace

A practical exploration of the internal and external preparation an actor must undergo to effectively render the moment-to-moment life of a given character. Focusing on monologues, scenes, and group explorations of text the class engages in a rigorous investigation of how the actor uses the self as the foundation for transformation. Course consists of close readings, research presentations, rehearsals and in-class scene presentations. Preference to senior and juniors. Open to non-majors. Limited enrollment. Admission by audition. See Syllabus page on Canvas for audition information and requirements. HU

* **THST 453b / ENGL 462b / FILM 401b, Writing Screenplay Adaptations** Donald Margulies

A workshop on the art of screenplay adaptation. Students read short stories, novels, and non-fiction; the screenplays based on that source material; and view and analyze the final product, the films themselves. Instruction focuses on the form, economy, and structure specific to screenwriting. Weekly writing exercises supplement the creation of a final project: a short screenplay based on source material of the student's choosing.

Previous experience in writing for film or stage would be advantageous but is not required. Restricted to juniors and seniors, or by permission of the instructor. HU

* **THST 457a / AMST 463a / EVST 463a / FILM 455a, 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

* **THST 459a / AFAM 412a / AMST 408a / ER&M 408a, Race and Comedy** Albert Laguna

Introduction to theories of the ludic and to critical race theory. Ways in which comic modes have been utilized by racialized subjects to represent and issue critiques of the dominant culture. Analysis of stand-up comedy, film, television, and novels. HU

* **THST 471a, Directed Independent Study** Staff

An independent study should generally conform to the standards and procedures of the senior project, THST 491, even when not undertaken by a senior. If the independent study is a performance or directing project, the adviser visits rehearsals and performances at the mutual convenience of adviser and student. The project must be accompanied by an essay of about fifteen pages, worth about half the final grade. Although the paper's requirements vary with the project and its adviser, it must be more than a rehearsal log. The paper typically engages interpretative and performance issues as revealed in other productions of the work (if they exist). The writing should be concomitant with rehearsal, to enable each to inform the other, and a draft must be presented to, and commented on by, the adviser at least a week before – not after – the final performance. The final version of the paper, incorporating adjustments and reflections, should be turned in to the adviser no later than ten days after the performance closes, and no later than the first day of the final examination period. An essay project entails substantial reading, at least four meetings with the adviser, and a paper or papers totaling at least twenty pages. A playwriting project normally requires twenty new script pages every two weeks of the term and regular meetings with the adviser. A final draft of the entire script is the culmination of the term's work. Application forms are available from the director of undergraduate studies. Juniors may use one term of these courses to prepare for their senior projects. Open to juniors and seniors. Prerequisites: THST 210 and one seminar.

* **THST 491a or b, Senior Project in Theater Studies** Nathan Roberts and Dan Egan
Students must submit proposals for senior projects to the Theater Studies office by the deadline announced by the director of undergraduate studies. Attendance at weekly section meetings is required for all students undertaking production projects. Application forms are available in the Theater Studies office, 220 York St.

Tibetan (TBTN)

Turkish (TKSH)

TKSH 110a, 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 120b, Elementary Modern Turkish II Meryem Yalcin

Continuation of TKSH 110. Prerequisite: TKSH 110 or permission of instructor. L2 1½ Course cr

TKSH 130a, 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 120 or permission of instructor. L3 1½ Course cr

TKSH 140b, Intermediate Turkish II Meryem Yalcin

Continuation of TKSH 130. Prerequisite: TKSH 130. L4 1½ Course cr

TKSH 151b, Advanced Turkish II Meryem Yalcin

Continuation of TKSH 150. An advanced language course focused on improving students' reading, writing, listening, and speaking skills in modern Turkish. Extensive study of vocabulary and idiomatic expressions. Readings from genres including academic articles, critical essays, literature, newspaper articles, and formal business writing. Screening of films, documentaries, and news broadcasts. Prerequisite: TKSH 150. L5 RP

Twi (Twi)

Ukrainian (UKRN)

UKRN 110a, Elementary Ukrainian I Staff

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. 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. L1 RP 1½ Course cr

* **UKRN 120b, Elementary Ukrainian II** Staff

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. 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. L2 1½ Course cr

*** UKRN 130a, Intermediate Ukrainian I** Staff

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 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

RP 1½ Course cr

*** UKRN 140b, Intermediate Ukrainian II** Staff

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

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 RP 1½ Course cr

*** UKRN 150a, 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 minjin.hashbat@yale.edu for more information. L5 RP

UKRN 160b, 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 minjin.hashbat@yale.edu for more information. RP

Urban Studies (URBN)

URBN 160a / ARCH 160a, Introduction to Urban Studies Elihu Rubin

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

URBN 200b / ARCH 200b, 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 280b / AMST 197b / ARCH 280b / HSAR 219b, American Architecture and Urbanism Elihu Rubin

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

URBN 304b / AFAM 164b / PLSC 263b, The Politics of "The Wire": HBO's Portrayal of the American City Allison Harris

This class uses HBO's groundbreaking series "The Wire" to investigate cities, their problems, and their politics. We watch all five seasons of the show as social scientists and use it to learn about important social scientific concepts and theories, and apply those theories to such phenomena as the politics of crime, policing, and local elections. Each week, the assigned readings – articles and book excerpts from political science as well as other social sciences – highlight the social scientific concepts displayed in the assigned episodes and provide context for lectures. All of the assignments work together to expose students to social science, how social science is conducted, and how political science can help us better understand the world around us. SO

*** URBN 314b / ARCH 314b, 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 places them within their historical and theoretical context. HU RP

*** URBN 327a / ARCH 327a, 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 341b / ARCH 341b / GBL 253b / LAST 318b, Globalization Space Keller
Easterling

Infrastructure space as a primary medium of change in global polity. Networks of trade, energy, communication, transportation, spatial products, finance, management, and labor, as well as new strains of political opportunity that reside within their spatial disposition. Case studies include free zones and automated ports around the world, satellite urbanism in South Asia, high-speed rail in Japan and the Middle East, agripoles in southern Spain, fiber optic submarine cable in East Africa, spatial products of tourism in North Korea, and management platforms of the International Organization for Standardization. HU

URBN 345a / ARCH 345a, Civic Art: Introduction to Urban Design Alan Plattus
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

* **URBN 353a / ARCH 353a, Urban Lab: Urban Field Geography** Elihu Rubin
A methods seminar in urban field geography. Traveling on foot, students engage in on-site study of architecture, urban planning and design, cultural landscapes, and spatial patterns in the city. Learn how to "read" the urban landscape, the intersection of forces that have produced the built environment over time. HU 1½ Course cr

* **URBN 360b / ARCH 360b, Urban Lab: An Urban World** Staff
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 362a / ARCH 362a, Urban Lab: City Making** Anthony Acciavatti
How architects represent, analyze, construct, and speculate on critical urban conditions as distinct approaches to city making. Investigation of a case study analyzing urban morphologies and the spatial systems of a city through diverse means of representation that address historical, social, political, and environmental issues. Through maps, diagrams, collages and text, students learn to understand spatial problems and project urban interventions. Prerequisites: For non-majors: permission of the instructor is required. For ARCH majors: ARCH 150, 200, and 280. 1½ Course cr

* **URBN 414b / ARCH 354b, New York as Incubator of 20th-Century Urbanism: Four Urban Thinkers and the City They Envisioned** Joan Ockman

This seminar is conceived as an argument among four polemical urban thinkers whose respective visions of the city were shaped by their response to the twentieth-century evolution of New York City: Lewis Mumford (1895–1990), Robert Moses (1888–1981), Jane Jacobs (1916–2006), and Rem Koolhaas (1944–). Among the issues that variously preoccupied them (and at times brought them into direct conflict) were housing and infrastructure, social diversity and environmental sustainability, civic representation and urban imagination. New York has been called the capital of the twentieth century. What lessons – what “usable past,” to borrow a concept from Mumford – does New York’s history offer us? And what kind of city is New York becoming in the twenty-first century? The aim of the seminar is twofold: to reconsider the legacy of this quartet of visionary intellectuals; and to trace modern New York’s urban and architectural development. HU

* **URBN 416a / ARCH 316a, 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 417b / ARCH 325b, Fugitive Practice: Introducing, Recentering, and Exploring Black and Indigenous Design Methods** Jerome Haferd and Curry Hackett

This seminar introduces and explores Black, indigenous, and other historically marginalized modes of cultural production – collectively referred to here as “fugitive practices.” The course confronts the erasure (and re-centering) of these modes by rethinking the episteme of architecture – questioning history, planning, and urbanism – but also of the body, the design of objects, and making. Modes of sociocultural and aesthetic production explored in the course may include: improvisation in jazz, hip-hop and social dance; textiles of the Modern African Diaspora and indigenous peoples; informal economies; ingenuity in vernacular architecture; and others. The course is structured around seven two-week “modules,” each containing a seminar discussion, a design exercise, and a short written accompaniment. It is conducted in collaboration with a parallel seminar being offered by faculty at Howard University. HU RP

* **URBN 490a / ARCH 490a, Senior Research Colloquium** Marta Caldeira

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 491b / ARCH 491b, Senior Project** Marta Caldeira

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 110a, 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 120b, Elementary Vietnamese II Quang Van

Continuation of VIET 110. L2 1½ Course cr

*** VIET 132a, 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 142b, 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 160a, 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 470a and VIET 471b, Independent Tutorial** Quang Van

For students with advanced Vietnamese 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. Permission to enroll requires submission of a detailed project proposal and its approval by the program adviser.

Wolof (WLOF)

Women's Gender and Sexuality Studies (WGSS)

* WGSS 031a / AMST 031a, LGBTQ Spaces and Places Terrell 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. HU

* WGSS 032b, 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. Preregistration required; see under First-Year Seminar Program. WR, HU

WGSS 110a / AMST 134a / ER&M 264a / SOCY 134a, Sex and Gender in Society

Rene Almeling

Introduction to the social processes through which people are categorized in terms of sex and gender, and how these social processes shape individual experiences of the world. Sex and gender in relation to race/ethnicity, class, sexuality, nationality, education, work, family, reproduction, and health. SO

WGSS 125b / AFAM 115b, "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

WGSS 127a / ER&M 127a / EVST 127a / SOCY 127a, Health and Illness in Social Context Alka Menon

Present-day medicine and health care provide solutions to an ever-increasing array of human problems. Yet the achievement of health can be elusive. This course provides a broad introduction to the domains of health and illness in the U.S., with some coverage of international trends and topics. Students analyze how our personal health and public health are shaped by social structures, political struggles, expert knowledge, and medical markets. Topics include the cultural and social meanings associated with health and illness; inequalities in health and health care access and provision; controversies

surrounding healthcare, medical knowledge production, and medical decision-making; and the social institutions of the health care industry. None SO

WGSS 145b / LING 146b / PSYC 329b, 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. SO

WGSS 194a / ENGL 194a, Queer Modernisms Jill Richards

Study of modernist literature and the historical formation of homosexual identity from the late nineteenth through mid-twentieth centuries. Topics include: sexology as a medical and disciplinary practice; decadence and theories of degeneration; the criminalization of homosexuality in the Wilde and Pemberton-Billing trials; cross-dressing and drag balls in Harlem; transsexuality and sex-reassignment surgery; lesbian periodical cultures; nightlife and cruising; gay Berlin and the rise of fascism; colonial narratives of same-sex desire; and the salon cultures of expatriate Paris. WR, HU

*** WGSS 202a / AFAM 239a / AMST 461a / EDST 209a / ER&M 292a, 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. WR, HU

*** WGSS 205a, Bodies and Pleasures, Sex and Genders** Regina Kunzel

This seminar engages cultural analyses of embodiment, its pleasures—and by extension its pains—to interrogate sex, sexuality, and gender as analytical categories. Its aim is to critically evaluate formative concepts and theories that have been subject to debates within gender studies, psychoanalysis, philosophy, anthropology, critical race studies, and history. Readings by Freud, Foucault, Berlant, Butler, Rubin, and others help explain how terms like “women” and “men,” “femininity” and “masculinity,” as well as “homosexuality” and “heterosexuality,” “gender” and “transgender” have structured people’s experiences and their perceptions of their bodies. The potential our bodies have for “hanging on to ourselves” occupies a central position within scholarly canons, revealing also how these canons are always already imbricated in racialized hierarchies. SO

WGSS 207b / PLSC 298b, Gender, Justice, Power, Institutions Joseph Fischel

Examination of how inequalities based on gender, race, caste, class, sexuality as well as a host of other identities are embedded in institutions that make up our social world. From the family and the home to the workplace, from the University, and the Corporation, to the Military and Media, we track how inequalities emerge and are sustained by power and institutional structures. We also see how they are challenged and what sorts of instruments are needed to challenge them. In particular, we focus on sexual politics and sexual violence as a key issue to understanding the gendered

workings of institutions, in order to examine structures that sustain inequality. Through the semester, we hope to consider many domains of life—bedrooms and boardrooms, international borders and feminist movements—to understand the stubborn and sticky forms and hierarchies of power that are challenged and contested by activists, scholars, and communities. TR

* **WGSS 209a / CLCV 216a / LITR 239a / MGRK 216a, 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

* **WGSS 223b / ENGL 225b, Race and Gender in Transatlantic Literature, 1688–1818**

Jill Campbell

Construction of race and gender in literatures of Great Britain, North America, and the Caribbean from the late seventeenth to the early nineteenth century. Focus on the role of literature in advancing and contesting concepts of race and gender as features of identity and systems of power, with particular attention to the circulation of goods, people, ideas, and literary works among regions. Some authors include Aphra Behn, Phillis Wheatley, Olaudah Equiano, Leanora Sansay, Maria Edgeworth, Mary Wollstonecraft, and Mary Shelley. First of a two-term sequence; each term may be taken independently. WR, HU

* **WGSS 224a / ENGL 226a, Race and Gender in Transatlantic Literature, 1819 to the Present** Margaret Homans

Construction of race and gender in literatures of Great Britain, North America, and the Caribbean from the early nineteenth century to the present. Focus on the role of literature in advancing and contesting concepts of race and gender as features of identity and systems of power, with particular attention to the circulation of goods, people, ideas, and literary works among regions. Some authors include Charlotte Bronte, Sojourner Truth, Zora Neale Hurston, Virginia Woolf, Audre Lorde, Chimimanda Adichie, and Kabe Wilson. Second of a two-term sequence; each term may be taken independently. WR, HU

* **WGSS 229a, Beyond Seneca Falls: Histories of Feminism and Social Change in the Long 20th Century** Salonee Bhaman

For much of the 21st century, “feminism” has been a controversial term, perceived by some as expansive and revolutionary, others as radical or dangerous, and still others as a philosophy deeply limited in who was included in its mandate. This writing intensive seminar explores the roots and development of feminism a dynamic and contested ideology over course of the long 20th century, foregrounding the writing of individuals, activists, and movements that have claimed or reclaimed it in service of disparate political ends. Beginning with the work of antiracist pioneer Ida B. Well's struggle against racialized violence and sexual assault, this course explores movements for universal suffrage, anti-violence, reproductive justice, welfare, workplace safety, sexual liberation, anti-war activism, and solidarity struggles through an intersectional lens. Understanding the work of Black feminists, Third World feminists, Woman of Color feminists, Indigenous feminists, and transfeminists as central rather than ancillary to the development of feminist theory, practice, and praxis in the United States, this

course offers students chronological and thematic timeline that reframes the story of the feminist movement in the United States as one made up of interlocking and interrelated struggles for liberation. Students engage with a variety of primary and secondary sources in order to interrogate the ways that these individuals and groups made claims to freedom, autonomy, and justice that were rooted in their own positionality within American society. They also explore how these claims, when understood in relation to each other, defined the contours of feminist history across the contours of race, class, and gender identity. WR, HU

*** WGSS 230a / ANTH 230a, Evolutionary Biology of Women's Reproductive Lives**

Claudia Valeggia

Evolutionary and biosocial perspectives on female reproductive lives. Physiological, ecological, and social aspects of women's development from puberty through menopause and aging, with special attention to reproductive processes such as pregnancy, birth, and lactation. Variation in female life histories in a variety of cultural and ecological settings. Examples from both traditional and modern societies. SC

*** WGSS 233a / FILM 341a / MGRK 238a, 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. None HU

*** WGSS 260a, Food, Identity and Desire** Maria Trumpler

Exploration of how food—ingredients, cooking practices, and appetites—can intersect with gender, ethnicity, class, and national origin to produce profound experiences of identity and desire. Sources include memoir, cookbooks, movies, and fiction.

WGSS 272a / AMST 272a / ER&M 282a / HIST 183a, Asian American History, 1800 to the Present Mary Lui

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

*** WGSS 293b / CLCV 319b / HIST 242Jb / MGRK 300b, 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

* **WGSS 298a / AFAM 326a / AMST 312a / ER&M 310a, Postcolonial Cities of the West** Fadila Habchi

Examination of various texts and films pertaining to the representation of postcolonial cities in the global north and a range of social, political, and cultural issues that concern those who inhabit these spaces. HU

* **WGSS 306b / AMST 314b / ER&M 314b, Gender and Transgender** Greta LaFleur

Introduction to transgender studies, an emergent field that draws on gender studies, queer theory, sociology, feminist science studies, literary studies, and history. Representations of gender nonconformity in a cultural context dominated by a two-sex model of human gender differentiation. Sources include novels, autobiographies, films, and philosophy and criticism. RP

* **WGSS 316a / CLCV 313a, Women Who Kill** Ariel Kroeber

Women in ancient Greek mythology are often figured as killers and destroyers: of enemies, husbands, children, and cities. We read the ancient plays and poetry that depict these women, as well as modern reworkings and retellings of these stories. We explore how these texts understand women and femininity, why the connection between women and murder is so ubiquitous in Greek mythology, and what it means that the ancient authors we read—all of whom were men—so often returned to this theme. In addition to ancient authors, we read contemporary works of poetry and fiction that draw on these mythological stories and rework them in new ways. In the ancient sources we see authors reworking still older variations of the same stories, revealing the modern adaptations as a continuation of this process, remaking the stories once again. What can the approaches taken by our contemporary mythmakers to the murderous woman tell us about our own societies? WR, HU

* **WGSS 317b / HUMS 210b / ITAL 317b / LITR 180b, Women in the Middle Ages** Christiana Purdy Moudarres

Medieval understandings of womanhood examined through analysis of writings by and/or about women, from antiquity through the Middle Ages. Introduction to the premodern Western canon and assessment of the role that women played in its construction. HU

* **WGSS 319b / RLST 119b, The Animal and Religion** Staff

This interdisciplinary seminar analyzes key texts formulating the question of the (non)human and animal by examining the recent proliferation of work on animality, not only in religious studies, but also in Black studies, gender studies, philosophy, and anthropology. The course critically examines key accounts of religion and the animal in relation to colonialism, capitalism, race, gender, sexuality, and class. Questions explored include: What does animal religion or religious animality look like? How is the category of religion understood with respect to the nonhuman or less-than-human? What is the relationship of conceptions of the (non)human in modernity to the slave trade and colonialism? How do notions of personhood, spirituality, dominion, evolution, empathy, and cosmology relate to the (non)human and animal? HU

*** WGSS 332b / AFAM 348b / AMST 388b / ER&M 339b, James Baldwin 1964-1987: Transnationalism, Exile & Intimacy** Leah Mirakhor

The course explores Baldwin's oeuvre since 1964 until his death in 1987. As critics have noted, there has been a renaissance regarding the work of James Baldwin since 1999, with scholarly publications devoted to his work, public tributes, films, and publications of previously uncollected or out of print works. Critics had hailed Baldwin's earlier works—*Go Tell It on the Mountain*, *Giovanni's Room*, *Notes of a Native Son*—as his greatest literary accomplishments. After Baldwin's most celebrated work—*The Fire Next Time*—Baldwin appeared on the cover of *Time* magazine in 1963, under the heading "Birmingham and Beyond: The Negro's Push for Equality." In this moment, Baldwin became a celebrated public figure in the U.S. and beyond. Our class investigates the period after this height of celebrity, when critics lambasted him for being too political, too angry, too bitter, and losing narrative control and rigor. This two-decade span is significant because Baldwin was witness to the deaths and incarceration of Civil Rights leaders (whom he mourned as friends), the increased surveillance and incarceration of black activists, the Vietnam war, the emergence of Black Power, feminist movements, and gay and queer liberations. During this time, Baldwin lived primarily in Turkey and France, and continued to travel globally. Baldwin's essays, novels, speeches, and poetry wrestled with how to formally capture and witness the violences of imperialism, homophobia, and racism. Since his death, Baldwin's work has continued to influence and inform theoretical insights in American studies, literary studies, Black studies, and queer studies. Our class engages with Baldwin's formal practices, political contexts, and critical interpretations across these fields. Preference given to students with a background in African American Studies, WGGS, ERM, and American Studies. Previous readings of James Baldwin's works recommended but not required. HU

*** WGSS 335a / AMST 336a, LGBTQ Life Spans** Terrell 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 339b / ENGL 385b, Fiction and Sexual Politics** Margaret Homans

Historical survey of works of fiction that have shaped and responded to feminist, queer, and transgender thought from the late eighteenth century to the present. Authors include Wollstonecraft, C. Bronte, H. Jacobs, C. P. Gilman, R. Hall, Woolf, Wittig, Walker, Anzaldua, Morrison, Kingston, Winterson, and Bechdel. WR, HU

*** WGSS 340b / ENGL 291b, Feminist and Queer Theory** Craig Canfield

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 343a / AFAM 352a / AMST 438a / ER&M 291a / LITR 295a, Caribbean Diasporic Literature** Fadila Habchi

An examination of contemporary literature written by Caribbean writers who have migrated to, or who journey between, different countries around the Atlantic rim. Focus on literature written in English in the twentieth and twenty-first centuries, both fiction and nonfiction. Writers include Caryl Phillips, Nalo Hopkinson, and Jamaica Kincaid. HU

* **WGSS 347b / GMAN 373b / HIST 455Jb / HUMS 287b, Resistance in Theory and Practice** Terence Renaud

Exploration of the histories and theories of resistance in the modern world. How liberation movements, guerrillas, and oppressed groups appeal to resistance as an organizational strategy and as moral justification. Readings include Kant, Thoreau, Nietzsche, Luxemburg, Lenin, Gandhi, Fanon, Arendt, Marcuse, Foucault, A. Lorde, Said, and J. Butler. Themes include antifascism to terrorism; violence to nonviolence, the New Left to Black Lives Matter. HU

* **WGSS 348a / PHIL 344a, Feminist Ethics** Moya Mapps

In this course, we explore questions at the intersection of moral philosophy and feminist philosophy. Is there a distinctively feminine way to approach moral reasoning? If so, should we resist this feminine moral orientation as patriarchal, overly demanding, or otherwise oppressive? Or should we embrace it? This writing-intensive course is designed to strengthen writing skills. We also discuss meta-philosophical questions about the methods of mainstream moral philosophy, and about the analytic philosophy paper as a genre of writing. Prerequisite: At least one essay-based philosophy course. (Ideally in moral philosophy, feminist philosophy, or a related subject.) WR, HU

* **WGSS 372a / AMST 382a, Theory and Politics of Sexual Consent** Joseph Fischel

Political, legal, and feminist theory and critiques of the concept of sexual consent. Topics such as sex work, nonnormative sex, and sex across age differences explored through film, autobiography, literature, queer commentary, and legal theory. U.S. and Connecticut legal cases regarding sexual violence and assault. SO

* **WGSS 378a / ANTH 381a, Sex and Global Politics** Graeme Reid

Global perspectives on the sexual politics of gender identity, sexual orientation, and human rights. Examination of historical, cultural, and political aspects of sexual orientation and gender identity in the context of globalization. SO

* **WGSS 386a / AFAM 456a / AMST 457a, American Abolition: From Slavery to Mass Incarceration** Micah Khater

This seminar is an interdisciplinary, historically-grounded examination of Black abolitionism in the United States from the mid-nineteenth century to the twenty-first century. Students engage deeply with readings in Black Feminist Theory, social and cultural history, literature, Disability Studies, and queer theory in order to investigate how abolitionist frameworks changed over time and, sometimes, remained the same. While this course focuses explicitly on Black activists who espoused abolitionism; it is important to remember that abolition did not always figure into the Black Freedom Struggle. As we navigate the expansion and contraction of abolitionism, we also consider why criminal justice *reform*, rather than abolition, was a central demand

of Black political organizing. In order to better understand the complicated history of twenty-first century abolitionism – including its epistemological ties to histories of slavery – we engage with major paradigms in Black history. AFAM 162 is highly encouraged. HU

*** WGSS 390b / ER&M 360b / HLTH 370b / HSHM 432b / SOCY 390b, Politics of Reproduction** Rene Almeling

Reproduction as a process that is simultaneously biological and social, involving male and female bodies, family formation, and powerful social institutions such as medicine, law, and the marketplace. Sociological research on reproductive topics such as pregnancy, birth, abortion, contraception, infertility, reproductive technology, and aging. Core sociological concepts used to examine how the politics of reproduction are shaped by the intersecting inequalities of gender, race, class, and sexuality. WR, SO

*** WGSS 398b, Junior Research Seminar** Staff

An interdisciplinary approach to studying gender and sexuality. Exploration of a range of relevant theoretical frameworks and methodologies. Prepares students for the senior essay. WR, SO

*** WGSS 403a / SPAN 323a, 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 407b / ANTH 308b, Feminist & Queer Ethnographies: Family, Community, Nation** Eda Pepi

This seminar centers the analytics and methods that feminist and queer ethnographic analyses have brought to the fore to revisit a cluster of topical issues, this year assembled around the theme: *Family, Community, Nation*. As a site in which personhood is distributed and contested, the “family” is one of the building blocks of social scientific analysis – along with “community” and “nation.” Seen as ideological lynchpins for the reproduction of the social order, processes of family-making – like marriage, divorce, childbirth, and intergenerational flows – have been codified differently across historical and cultural contexts. This course engages the feminist and queer ethnographies that revealed the political hierarchies that emerge from seemingly natural categories and distinctions of kinship. We trace the gendered, sexualized, class-making, and racialized concepts, processes, and implicit understandings of family-making that chart the public and private spheres of community and national terrains. Students grapple with the processes of naturalization and denaturalization through which the “political” is mobilized and dyads like kin/kith, blood/soil, human/nonhuman, citizen/noncitizen, us/them, are made to appear. We also engage with feminist and queer methodologies that conjure up speculative fabulations for, what Saidiya Hartman has called, “the radical hope for living otherwise.” We do so at a time when the global Covid-19 pandemic has demanded the resurgence of the state, tested community ties, transformed family arrangements, and isolated most of the world's population within domestic domains. HU, SO RP

*** WGSS 408a / AMST 345a / ER&M 409a, Latinx Ethnography** Ana Ramos-Zayas

Consideration of ethnography within the genealogy and intellectual traditions of Latinx Studies. Topics include: questions of knowledge production and epistemological

traditions in Latin America and U.S. Latino communities; conceptions of migration, transnationalism, and space; perspectives on "(il)legality" and criminalization; labor, wealth, and class identities; contextual understandings of gender and sexuality; theorizations of affect and intimate lives; and the politics of race and inequality under white liberalism and conservatism in the United States. SO

* **WGSS 416b / ER&M 335b / FREN 416b, Social Mobility and Migration** Morgane Cadieu

Exploration of mobility in the French social landscape and its representations in contemporary French and Francophone texts and films; the intersectionality of class, race, gender, and sexuality; emancipation, migration, demotion, and precarity; labor and the workplace; the interaction between social class and literary style. Works by: Angot, Eribon, Ernaux, Kechiche, Louis, Mukasonga, NDiaye, Taïa. Theoretical excerpts by: Berlant, Bourdieu, Delphy, Fraser, Ranci re, Piketty. Students have the possibility to put the corpus in dialogue with the literature of other countries. L5, HU

* **WGSS 425b / ENGL 238b, Disability & Sexuality** Joseph Fischel and Jill Richards
The course examines how intimacies, pleasures, bodies, genders, and sexualities take shape across the spectrum of ability. The course draws from an array of scholarly approaches to dis/ability to theorize normative parameters around sex and sociality, and to imagine alternatives. Most weeks integrate scholarly theoretic texts with cultural artifacts, including poetry, visual art, cinema, podcasts, and other media. Topics include embodiment and gender pluralism, the social model and its discontents, pregnancy and reproductive justice, HIV/AIDS, pornography and representation, toxicity and contagion, care work and dependency, and vulnerability. HU, SO

* **WGSS 426a / ENGL 344a, Virginia Woolf** Margaret Homans

A study of the major novels and other writings by Virginia Woolf, with additional readings in historical contexts and in Woolf biography and criticism. Focus on Woolf's modernist formal experimentation and on her responses and contributions to political movements of her day, principally feminism and pacifism; attention also to the critical reception of her work, with emphasis on feminist and queer literary criticism and theory. WR, HU

* **WGSS 427a / AMST 427a / PLSC 269a, Politics of Gender and Sexuality in the United States** Dara Strolovitch

The 2016 Presidential election made clear that gender matters a great deal in American politics, but it also revealed that *how* gender matters is far from obvious. This course explores the ways in which gender and sexuality shape and are shaped by American politics and public policy. We explore the history, findings, and controversies in research about gender and sexuality in American politics from a range of approaches, examining what political science research helps us understand about questions such as: Does gender influence political campaigns and whether people will vote for particular candidates? Once elected, are gender and sexuality related to legislators' behavior in office? How are norms related to race, class, gender, and sexuality reflected in and constructed by public policy? We also explore feminist, queer, and intersectional theories and methodologies and important work from other disciplines and interdisciplines, paying particular attention to the implications of intersectionality for understanding gender, sexuality, and politics. We also analyze the ways in which gender and sexuality intersect with other politically salient categories, identities, and forms of marginalization, including race, ethnicity, class, and ideological and partisan

identification, paying particular attention to their implications for the 2016, 2018, and 2020 elections. SO

*** WGSS 430a / ANTH 441a / MMES 399a / MMES 430a, Gender and Citizenship in the Middle East** Eda Pepi

This seminar explores the gendered and ethnic-based social processes and forms of power that citizenship, statelessness, and migration crises fuel, and are fueled by, in the Middle East and North Africa. The history of gender and citizenship in the region is imbricated in ethnosexual and orientalist colonial legacies that articulate a racialized problematic of “modernity.” Part of these legacies involve obscuring the role that women, sexual minorities, and gender, more broadly, have played in framing citizenship and statehood in the Middle East in global, regional, and local imaginations not only as border policing and legal doctrine, but as signifier—and *reifier*—of culture, race, and ethnicity. By examining the gendered and sexual dimensions of war, conflict, and partition, and the formation of modern citizenship in the Middle East, the seminar presents ethnographic, historical, literary and visual scholarship that theorizes the role of kinship and citizenship in gendered and racialized narratives of the nation and political sovereignty. SO

*** WGSS 431b / ANTH 451b, Intersectionality and Women’s Health** Marcia Inhorn
The intersections of race, class, gender, and other axes of “difference” and their effects on women’s health, primarily in the contemporary United States. Recent feminist approaches to intersectionality and multiplicity of oppressions theory. Ways in which anthropologists studying women’s health issues have contributed to social and feminist theory at the intersections of race, class, and gender. SO

*** WGSS 438a, 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 462a / AMST 484a / ER&M 405a / FILM 402a / HSAR 493a, Visual Kinship, Families, and Photography** Laura Wexler

Exploration of the history and practice of family photography from an interdisciplinary perspective. Study of family photographs from the analog to the digital era, from snapshots to portraits, and from instrumental images to art exhibitions. Particular attention to the ways in which family photographs have helped establish gendered and racial hierarchies and examination of recent ways of reconceiving these images. HU

*** WGSS 463b / AMST 462b / ER&M 462b, The Study of Privilege in the Americas**

Ana Ramos-Zayas

Examination of inequality, not only through experiences of the poor and marginal, but also through institutions, beliefs, social norms, and everyday practices of the privileged. Topics include: critical examination of key concepts like "studying up," "elite," and "privilege," as well as variations in forms of capital; institutional sites of privilege (elite prep schools, Wall Street); living spaces and social networks (gated communities, private clubs); privilege in intersectional contexts (privilege and race, class, and gender); and everyday practices of intimacy and affect that characterize, solidify, and promote privilege. SO

*** WGSS 471a or b, Independent Directed Study** Staff

For students who wish to explore an aspect of women's, gender, and sexuality studies not covered by existing courses. The course may be used for research or directed readings and should include one lengthy or several short essays. Students meet with their adviser regularly. To apply for admission, students present a prospectus to the director of undergraduate studies along with a letter of support from the adviser. The prospectus must include a description of the research area, a core bibliography, and the expected sequence and scope of written assignments.

*** WGSS 481a / HSAR 480a, Woman/Artist** Carol Armstrong

This seminar focuses on women artists of the 19th and 20th centuries in Western Europe and the United States, while also looking back to the Renaissance through the 18th centuries, and forward to our own "global" moment. Beginning with the advent of feminist art history, it moves chronologically, intertwining the history of women artists with such questions as: What are the pros and cons of singling out women artists? What were the institutional restraints on women's entering the the canon of "great" art? How did conceptions of "femininity," female agency, and the "male gaze" intersect with the history of art by women? How did women's roles as artist's patrons or models inflect their own or others' activities as artists? How did the political revolutions of the 18th, 19th, and 20th centuries change things for women artists? How did the public and private spheres of modernity shape the role of women in the story of "modernism"? How did the first, second, and third waves of feminism address the problem of the women artist? How did/do matters of sex and gender intersect with those of race and class in the identity politics of contemporary world art? What is feminist art? This class is offered in tandem with the YUAG exhibition "On the Basis of Art: 150 Years of Women at Yale," and culminates in a conference addressed to the two key terms of "Woman/Artist." HU

*** WGSS 490a or b, The Senior Colloquium** Staff

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 491a or b, The Senior Essay** Staff

Independent research on, and writing of, the senior essay.

Yoruba (YORU)

YORU 110a, 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 120b, Beginning Yorùbá II Staff

Continuing practice in using and recognizing tone through dialogues. More emphasis is placed on simple cultural texts and role playing. Prerequisite: YORU 110. L2
1½ Course cr

YORU 130a, 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 140b, Intermediate Yorùbá II Staff

Students are exposed to more idiomatic use of the language in a variety of interactions, including occupational, social, religious, and educational. Cultural documents include literary and nonliterary texts. After YORU 130. L4 1½ Course cr

YORU 150a, 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 (*ewi*); and music. After YORU 140. L5

YORU 160b, Advanced Yorùbá II Oluseye Adesola

Continuing development of students' aural and reading comprehension and speaking and writing skills, with emphasis on idiomatic usage and stylistic nuance. Study materials are selected to reflect research interests of the students. After YORU 150. L5

YORU 170a, Topics in Yorùbá Literature and Culture Oluseye Adesola

Advanced readings and discussion concerning Yorùbá literature and culture. Focus on Yorùbá history, poetry, novels, movies, dramas, and oral folklore, especially from Nigeria. Insight into Yorùbá philosophy and ways of life. Prerequisite: YORU 160. L5, HU

YORU 172b, Topics in Yorùbá Literature and Culture II Oluseye Adesola

Continuation of YORU 170. After YORU 170. L5, HU

Zulu (ZULU)

ZULU 110a, 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 120b, 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 130a, 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 140b, 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 150a, 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 160b, 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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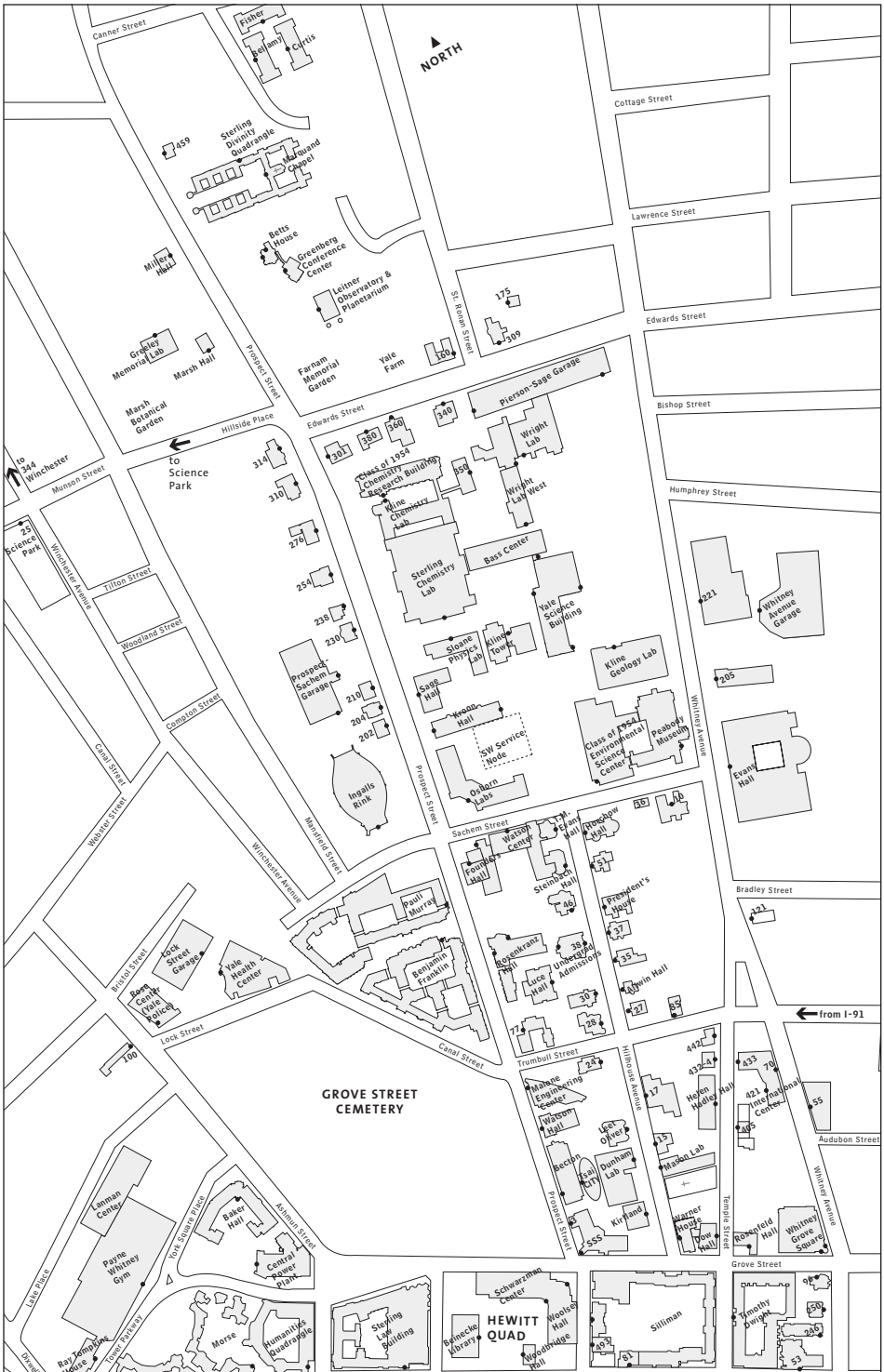
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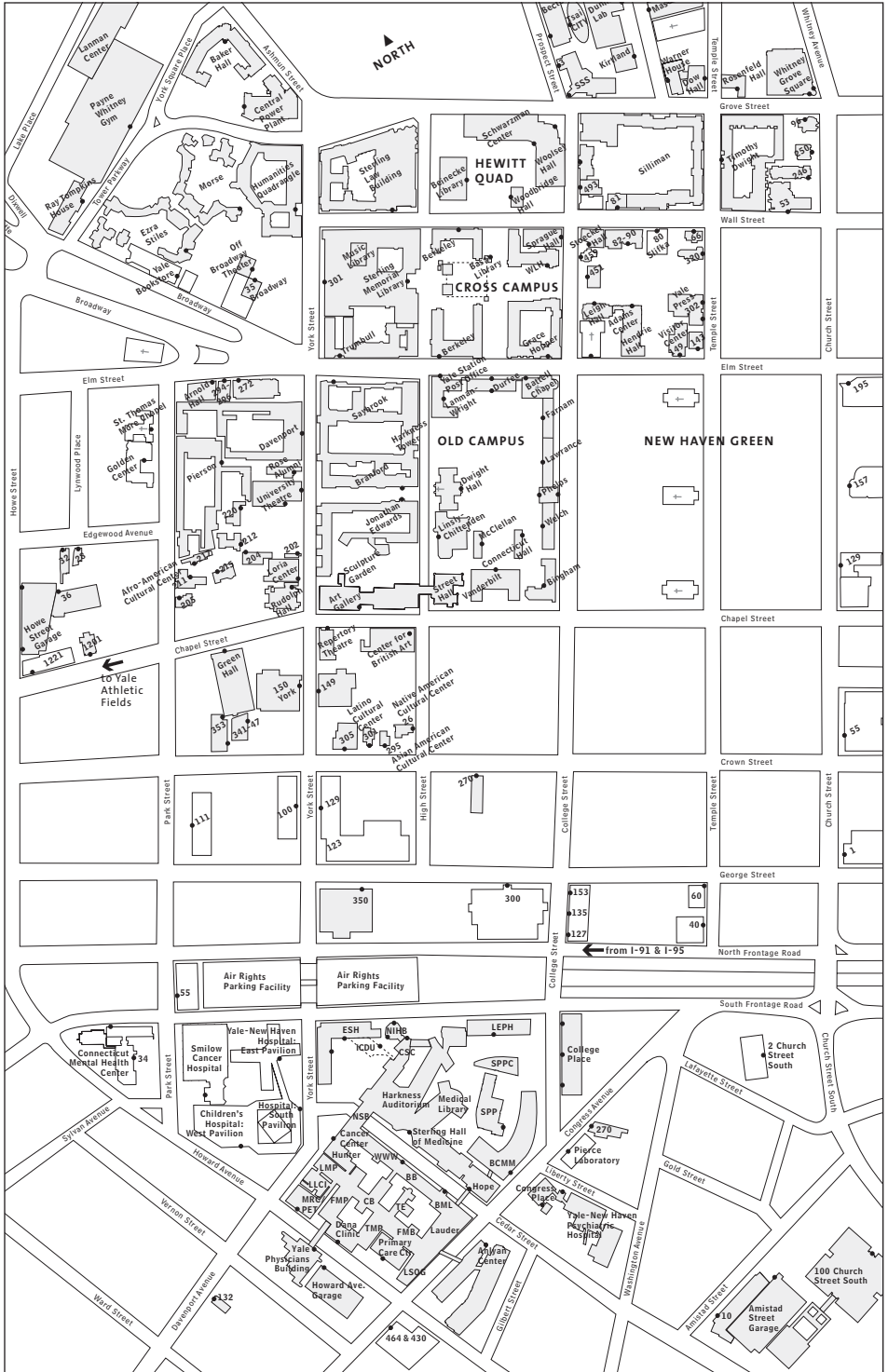
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YALE UNIVERSITY CAMPUS NORTH



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 affirmatively seeks to attract to its faculty, staff, and student body qualified persons of diverse backgrounds. In accordance with this policy and as delineated by federal and Connecticut law, Yale does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's sex, race, color, religion, age, disability, status as a protected veteran, or national or ethnic origin; nor does Yale discriminate on the basis of sexual orientation or gender identity or expression.

University policy is committed to affirmative action under law in employment of women, minority group members, individuals with disabilities, and protected veterans.

Inquiries concerning these policies may be referred to Valarie Stanley, Senior Director of the Office of Institutional Equity and Access, 203.432.0849. For additional information, see <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, Stephanie Spangler, at 203.432.4446 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, fax 617.289.0150, TDD 800.877.8339, or ocr.boston@ed.gov.

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; telephone, 203.432.9300; website, <http://admissions.yale.edu>.

Yale University's website is www.yale.edu; the Yale College Programs of Study is online at <http://catalog.yale.edu/ycps>.

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